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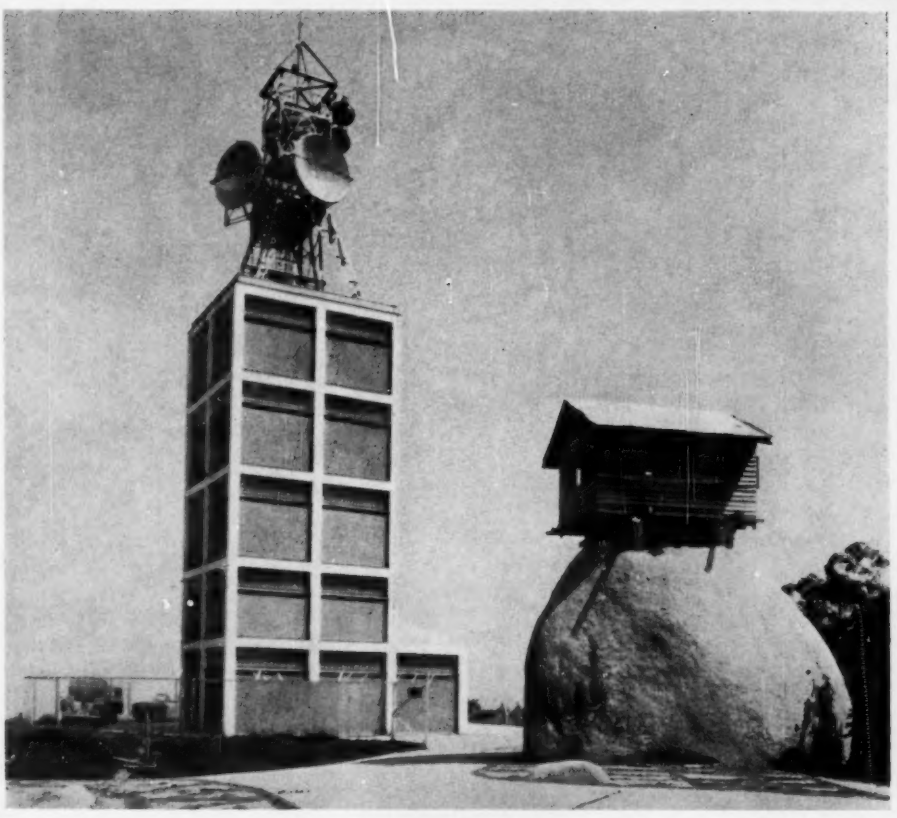
VOL. 158 — NO. 26

Telephony®

THE JOURNAL OF THE TELEPHONE INDUSTRY



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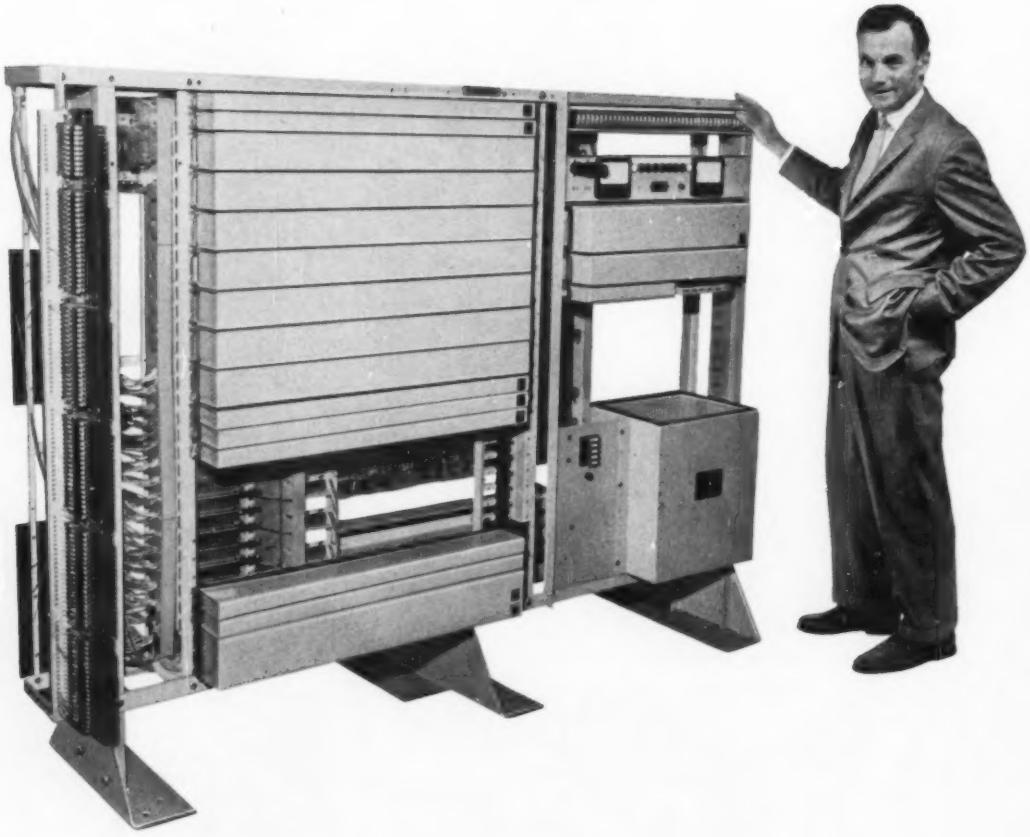

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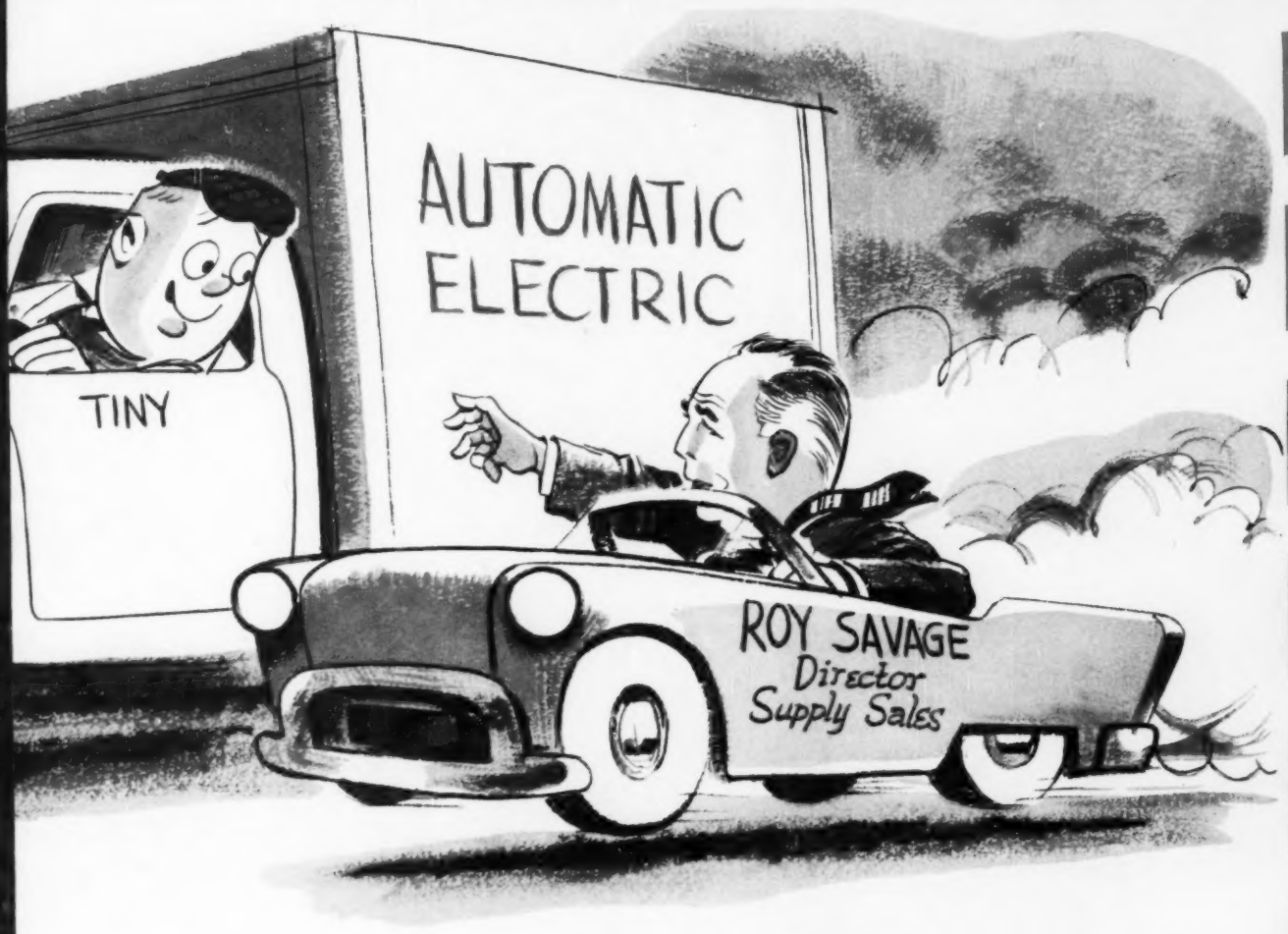

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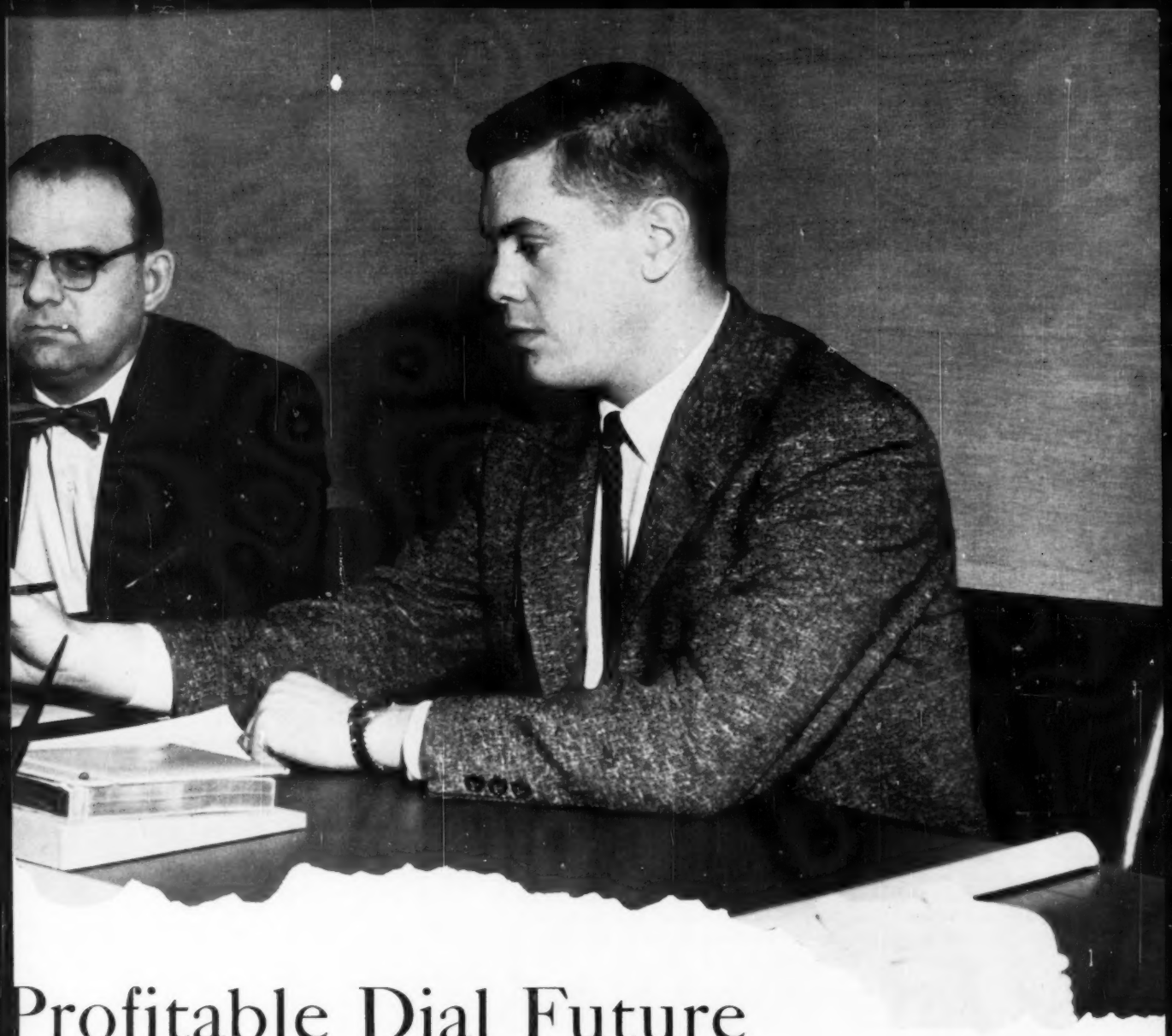

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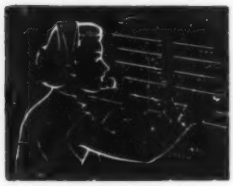

FLASHES AND PLUGS

ANY LEPRECHAUNS OUT YOUR WAY? Some time ago, the Electricity Board in Ireland was having trouble with the "wee people" while trying to erect a new power line. There were so many complications, it was thought possible the power poles might be crossing a traditional fairy ring. This is the story condensed from a longer version:

"After erecting a run of poles one day, the next day the engineer found them uprooted. He learned that a local farmer, as well as the leprechauns, objected to this compulsory right-of-way.

"Quite seriously he was informed that it was the 'little people' who had pulled out the poles—and who did it again on the second night.

"The engineer, knowing his consumers, went to the village pub and happened to mention to the villagers that the force of the 'little people,' who had twice uprooted his poles in the night, was too strong for the Supply Board.

"He would have to abandon the project because there was no other available route for the line. He just couldn't resist the fairies.

"As many of the villagers had had their cottages wired in anticipation of receiving electricity in the near future, word must have been passed to the fairy world by some uniquely Irish method. Next day the engineers found the poles re-erected—and they stayed that way."—Reprinted from *Electrical World*, Oct. 19, 1959, Copyrighted 1959, McGraw-Hill Publishing Co., Inc.

•

TALKING INTO A HOLE—TSK! H. G. Owen reports in Bell Telephone Co. of Canada's *Blue Bell* magazine the story of a woman patient who had never seen a telephone. It was in the 1890's when Dr. Thomas Cotton, a native of Cowansville, Quebec, was one of the first telephone subscribers.

An elderly woman came to the office to consult the doctor while he was out on his rounds. The doctor's wife rang him up, spoke to him, and turned to tell the patient that he would be back right away. The caller, however, had rushed away in great agitation.

The elderly woman told a friend:

"There was a funny kind of box on the wall with a round hole in the middle. She stepped over to it, faced the wall, and kind of played with a sort of handle on the box. There was a kind of tinkle, like sleigh-bells.

"Then she talked into the hole, pretending she was speaking to someone inside the box! Told me she had talked to the doctor and he would be right over.

"My stars! I was scairt! That poor woman has sure lost her mind!"

•

OBFUSCATING THE PERTURBATION. *New Jersey Bell* magazine offers the following terms for a glossary of new business terms, probably, already familiar in most offices:

"A *Program* . . . Any assignment that can't be completed in one telephone call.

"*Channels* . . . The trail left by interoffice memos.

"*To Expedite* . . . To confound confusion with commotion."

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

June 25, 1960

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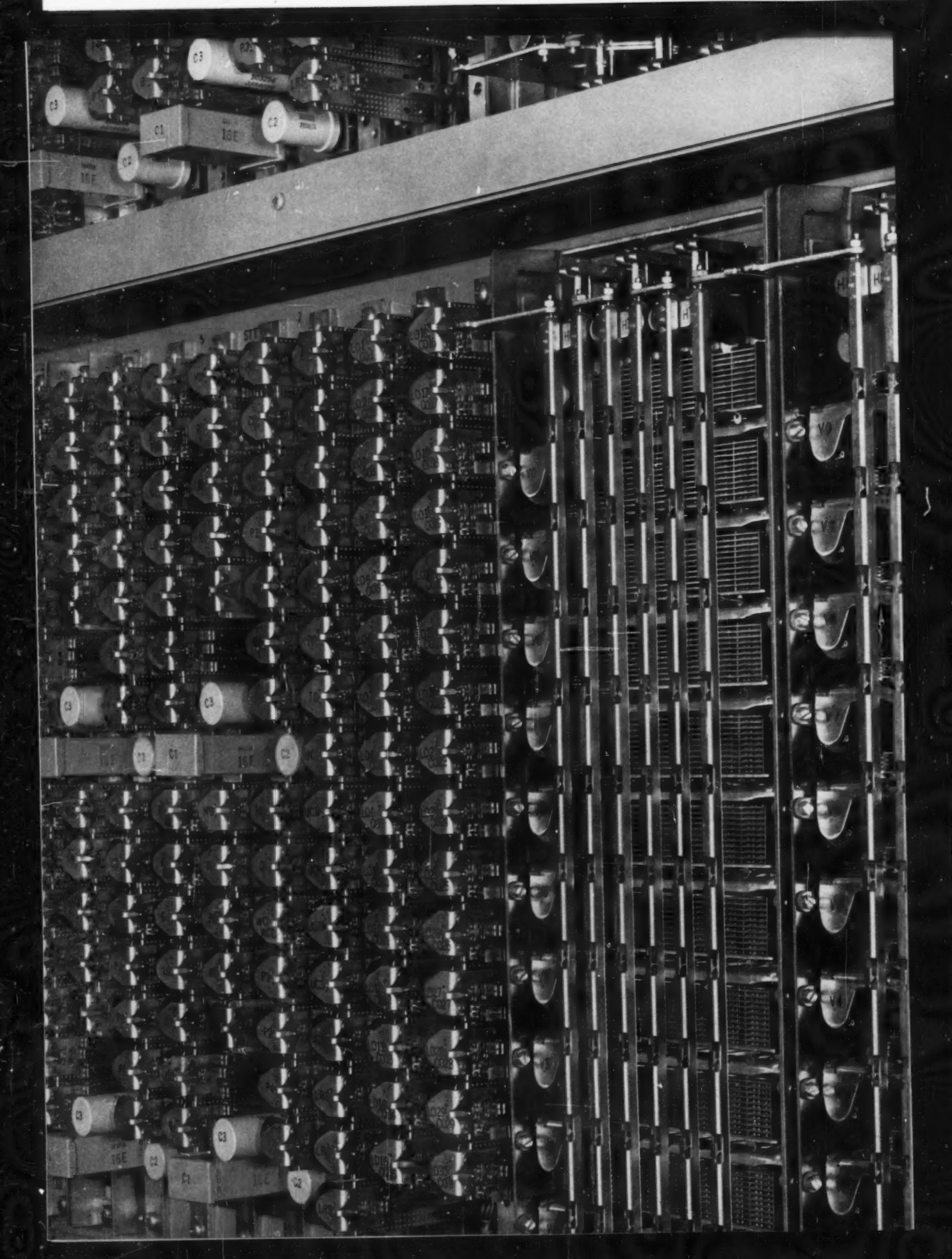

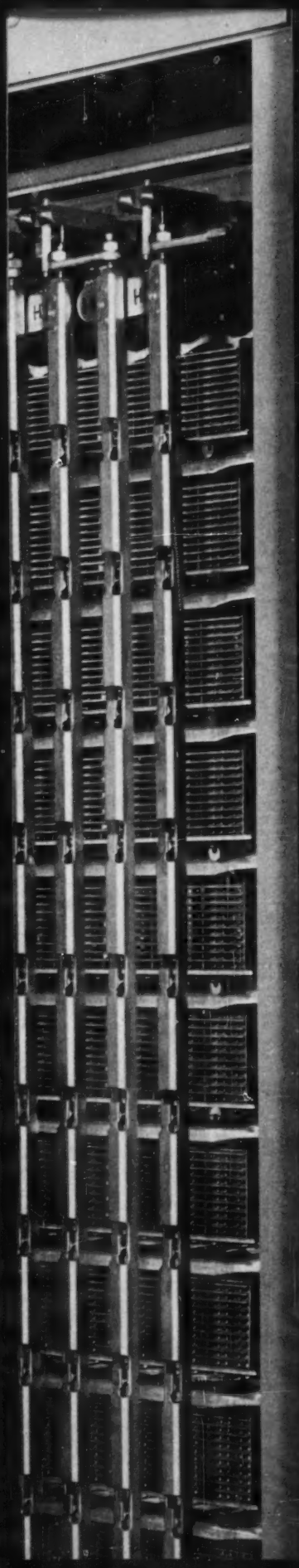

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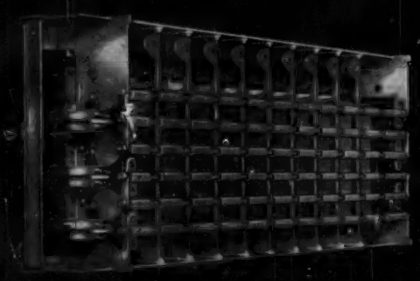

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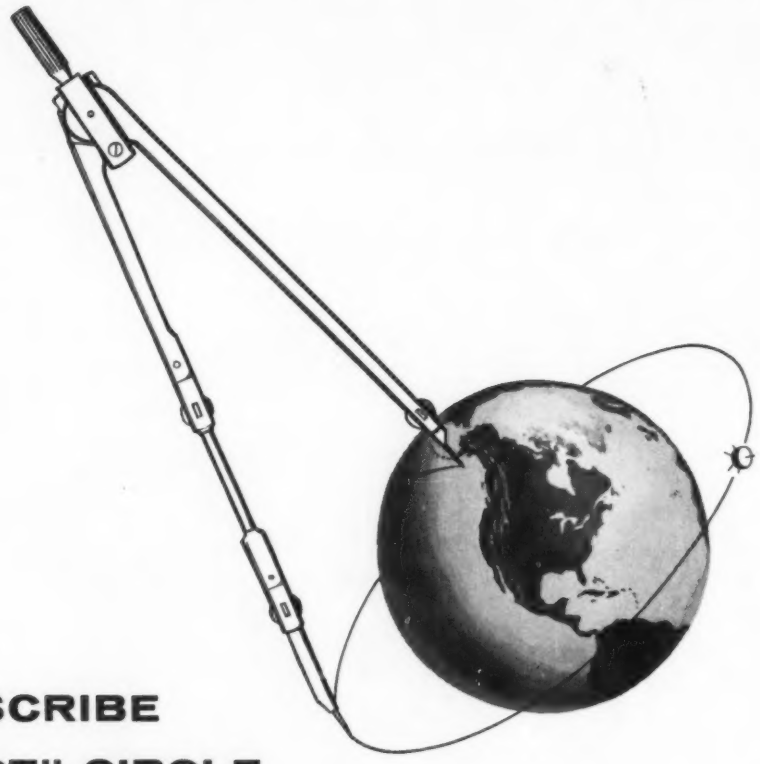

HOW TO SCRIBE A "PERFECT" CIRCLE IN OUTER SPACE

Bell Laboratories guidance system achieves unprecedented accuracy in steering Tiros weather satellite into orbit

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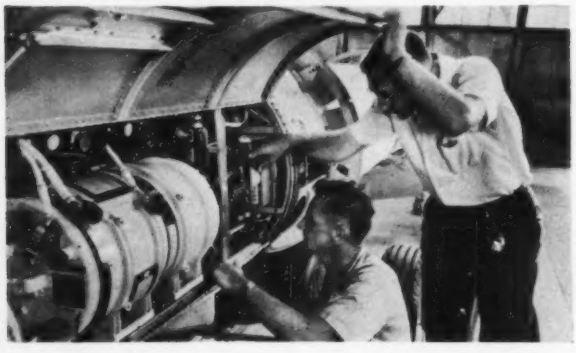
Two Bell Laboratories engineers, T. J. Grieser and D. R. Hagner, look over the second-stage section of the Air Force Thor-Able missile used to launch the NASA Tiros weather satellite.



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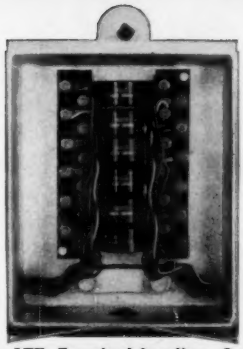

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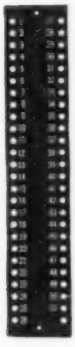

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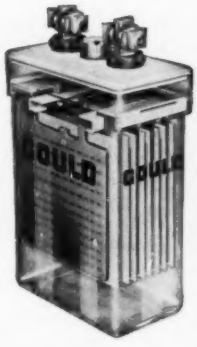

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR
AND EDITOR, PUBLIC UTILITIES FORTNIGHTLY

Senate reverses its own committee and votes to extend telephone excise tax for another year. . . . Transportation tax also extended. Wage-Hour exemption for small exchange operators in jeopardy.

IGNORING administration protests, the Senate Finance Committee on June 15, voted to repeal excise taxes on local telephone, telegram and personal transportation services at a cost to the Treasury of $752,300,000. The chances had appeared very good. Then came Majority Leader Johnson to the floor of the Senate on June 20 who made a passionate appeal to keep the excise tax for another year. The Senate then reversed its own committee and voted 54 to 30 to extend the telephone and telegraph taxes. The tax on travel tickets also was extended.

The Senate's action was taken in connection with the approval of an Administration request for a one-year extension of approximately 4 billion dollars of corporation and selected excise taxes which have been renewed from year to year since the Korean war. The committee also approved a one-year temporary national debt limit. Senator Byrd (D., Va.), chairman of the Senate Finance Committee, who opposed the motions repealing the telephone and telegraph taxes and the transportation levy, said the loss of revenue "seriously endangers the estimated surplus" for fiscal 1961. The President in his budget message had forecast a surplus of 4.2 billion dollars, but Byrd believes this is far too high.

Liberal Democrats on the 18-member Senate Finance Committee offered a number of "loophole" closing proposals, which they seriously argued would more than offset the revenue losses. But they were defeated on all of these. They subsequently served notice that they will reoffer their motions on the Senate floor.

It will be recalled that the Senate, itself, voted in the 1959 Revenue Act to make the general, or as it was formally called "local," telephone tax expire on June 30, 1960, and the transportation tax to decline from 10 per cent to 5 per cent at the same time. The House accepted these amendments subject to review, the same as the Korean taxes. But the House Ways and Means Committee said when reporting the tax rate extension bill to the House on May 31, that "no assurance was given that the rates of these taxes would be reduced in 1960."

And so it was that the House last month voted approval of the recommendation of the administration, and of the Ways and Means Committee, to renew for another year the taxes on both general telephone service and transportation. But it was passed only by a narrow squeak.

Now comes the Senate Finance Committee, on motion by Senator Smathers (D., Fla.), voting 10 to 6 to *repeal* the 10 per cent transportation tax. Nine Democrats and one Republican favored the cut; five Republicans and Senator Byrd voted against it. The estimated revenue loss was 290 million dollars. On a motion by Senator Talmadge (D., Ga.), the committee voted 11 to 6 to repeal the tax on telegrams. It was estimated that this would eliminate 17 to 18 million dollars in revenue. *The vote to repeal the general telephone and telegram tax, in a combined motion, was also 11 to 6—ten Democrats and one Republican for, and five Republicans and Byrd against.*

Senator Douglas (D., Ill.), said he was one of the committee members who sought unsuccessfully to offset the revenue losses by closing tax loopholes. He said he finally voted for the bill "in the belief that the only way to force the Treasury to back removal of tax injustices is to reduce their revenue." Senator McCarthy (D., Minn.) came within two votes of winning on a motion to repeal the 4 per cent credit allowed on dividends and interest. The vote against it was 9 to 7. He said the revenue could be used to offset losses from the telephone tax repeal. On a motion to inaugurate a withholding by corporations of taxes on dividends and interest paid after allowing a two-year grace period, McCarthy lost, 10 to 5.

Douglas proposed that expense account outlays for entertainment—other than food and drink—be disallowed as costs of doing business. This Douglas labeled "the yacht and My Fair Lady disallowance," saying it would ban charging theater tickets, the cost of maintaining yachts, club dues and similar items as costs of doing business. The committee liberals said they will make a floor fight for all of their "loophole" closing amendments.

Wage-Hour Exemption

As these lines are written, both the House and Senate Education and Labor committees had just about decided to broaden the Fair Labor Standards Act with amending bills. Probably by the time these lines appear in print, one or the other chambers will have acted.

Both the Senate and the House committee bills would drastically curtail the scope of the exemption now in effect whereby switchboard operators at *exchanges* of less than 750 stations are

not subject to minimum wage requirements. In the Senate, the Kennedy Bill would shrink this telephone operators' wage exemption to a mere skeleton. The Kennedy Bill provides that the exemption would only apply to operators of switchboards in private homes. The House bill is slightly more liberal for the small telephone companies, but it still substantially scuttles the scope of the present amendment. The House bill would put the exemption on a company basis rather than an exchange basis, meaning that all companies having more than 750 stations would lose the exemption. In other words, all the larger Independents, such as the General System, Lincoln (Neb.) Telephone & Telegraph Co., etc., and, in fact any Independent company of any size at all would have to start paying the minimum wages. Only those *companies* having less than 750 stations, regardless of switchboards or exchanges, would be covered.

It has been estimated that the Kennedy Bill in the Senate would bring 41,000 switchboard operators under the minimum wage law, leaving only about a thousand remaining under the exemption. This writer has seen no estimate of the number of telephone operators who would still be exempt under the House Bill.

What Congress will finally do as between the two bills, seemed to be a toss-up. But if Congress stays in session long enough, it seemed pretty certain that one or the other bill will finally be enacted at this session. In short, about the only possible outside chance that the present small exchange operator exemption will stand, lies in the legislation being caught in the last-minute log jam before Congress adjourns for the political party conventions next month. That could happen; and if it did happen, the present telephone operator wage exemption would be saved by the bell for another year.

But the determination of the Democratic majority to get this legislation through Congress as an accomplishment of the session for political campaign purposes is very strong. In fact, the leadership is so sensitive about going into the fall campaign with so little legislation enacted that it would be most surprising if the measure died by default.

What is at stake here, of course, is far more than the small exchange operator wage exemption. The other provisions of the bill embrace a broad bid for labor support, because it would extend the Fair Labor Standards Act to five million workers not now covered. It would also set new standards for 23.7 million workers who are already covered. For those workers now under the act, the minimum hourly rates would be increased from $1.00 to $1.15 in 1961, to $1.20 in 1962, and to $1.25 in 1963.

For those workers who would be brought under the act for the first time, such as telephone switchboard operators, there is a more graduated scale. Minimum wage would be $1.00 in 1961, with no maximum hours; $1.05 in 1962, with a 44-hour week; $1.25 in 1963, with a 42-hour week; and $1.25 in 1964, with a 40-hour week.

Congress and the FCC

The Senate Interstate Commerce Committee came to life this week and decided to report favorably the renomination of Commissioner Robert E. Lee to another term on the FCC. There may be some floor opposition, but eventual confirmation seems to be in prospect, now that the Lee nomination has been shaken loose from the deepfreeze which threatened to keep it locked in committee.

What evidently has happened here is a gentleman's agreement between the administration and majority leaders in the Senate. Three other federal regulatory nominations by President Eisenhower will definitely go over the end of the session without confirmation. These are the two names which Ike submitted last month for vacancies on the Federal Power Commission: Paul A. Sweeney, Justice Department attorney, to succeed the late John B. Hussey; and Thomas J. Donegan, former FBI attorney, to succeed Commissioner William R. Connole, whose term expires this month. The third appointment by Ike, which will go on the Senate shelf, involves the chairman of the Federal Trade Commission, Earl W. Kintner. The Senate Democrats frankly admit that they would like to keep these jobs open

(Continued on page 51)

REA Approves Loans Totaling $1,180,000

The Rural Electrification Administration has approved three telephone loans as follows:

Eastern Slope Rural Telephone Association, Limon, Colo; $177,000; June 6.

These funds will help the borrower to provide communications facilities to serve that portion of the Lowry Missile Complex which is located within its service area.

This and prior REA loans will assist the Eastern Slope company in furnishing new and improved service to 1,055 subscribers. The system will consist of six dial exchanges which now furnish service to approximately 950 of the subscribers.

•

Caldwell (Kan.) Telephone Co.; $834,000; June 6.

This loan will aid the company in improving service for 1,170 subscribers and in furnishing initial service to 377 subscribers. Service also will be provided to some subscribers in a fringe area in Oklahoma.

The borrower has recently acquired the Belle Plaine Telephone Co. and plans to acquire the Oxford Telephone Co. These two Kansas companies now furnish common battery and magneto service.

New facilities required to serve the expanded system will include a dial-commercial office building at Belle Plaine and a dial office in Oxford.

On completion of the facilities provided for in this and a prior REA loan, the borrower will be serving 2,707 subscribers. The system will consist of three exchanges. The Caldwell exchange now furnishes dial service to more than 1,000 of the subscribers.

•

The Rye (Colo.) Telephone Co.; $169,000; June 7.

This loan is extended to assist the company in improving service for 102 subscribers and in furnishing initial service to 340 subscribers.

This new borrower of REA funds proposes to install new and larger dial facilities in the present central-commercial office building in Rye. A portion of these funds will be used to refinance indebtedness incurred by the borrower in partially modernizing its present system.

Robert R. MacCormack is both president and manager of the Rye Telephone Co.

COMPETITION HERE

Biggest challenge facing telephone people today is developing the initiative to anticipate and fulfill customers' every need for additional and new communication services.

By C. C. PEARCE*

IT HAS BEEN over 60 years since the first commercial grade of telephone service was established. During the ensuing years the many telephone companies serving both large and small communities have, as a rule, enjoyed a monopoly, for two main reasons.

First, because it is more economical and practical for the customer to receive his telephone service from one company, and duplication of telephone service within a given community has long since passed into history.

Second, because, up to the present time, telephone companies have served their patrons, and controlled the service, through a physical connection from the switchboard to the subscribers' telephone instruments within their homes or businesses.

Connection Not Controlling Factor

We have now entered that period in the history of the telephone when physical connection of facilities will no longer be the controlling factor of service.

Microwave and two-way radio are now available to the general public, and almost every community in America today has at least a trucker, veterinarian, resort owner, rancher, taxi company, fire department, or law enforcement body, which is, in some way, using a communication service other than that provided by the local telephone company.

The following news item clipped from a midwestern farm paper indicates the type of competition facing every telephone company in furnishing local telephone service:

NEW TWO-WAY RADIO DESIGNED FOR FARMS

Have trouble calling Dad in from the field for dinner? Maybe a short-range two-way radio is what you need.

A new radio communications system designed especially for farm operations is now available.

Unlike most radio communication systems, no technical knowledge is required, no code tests or examinations have to be taken. The unit operates on the new citizens band at 27 megacycles and has a range of approximately 10 miles.

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*Mr. Pearce is President and principal owner of the Farmers Telephone Co. of Riceville, Ia. He also is First Vice President of the United States Independent Telephone Association.

C. C. PEARCE

The following statement, taken from a quarter-page ad in a leading farm publication, further stresses the competition telephone companies can look forward to:

NEW CITIZENS BAND

The Federal Communications Commission has authorized a new citizens radio service of 22 radio channels making practical radio telephones possible for everyone.

Field Wide Open

All that is required to take advantage of these offerings is a station authorization, which almost anybody over 18 years of age can obtain by filling out the proper application and forwarding it to the Federal Communications Commission in Washington, D. C. The decision of the FCC in 1959, to approve the licensing of private point-to-point communications systems, is of utmost importance to the telephone industry and to the customers we serve, and opens the door to further competition for the telephone companies.

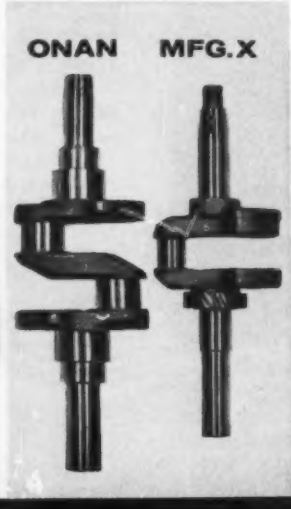
This is only one type of communication competition existing today. Recently, one of the major manufacturers of competitive inter-com equipment for business establishments ran an eight-page foldout advertisement in full color in one of the leading business magazines. It was actually a catalogue of everything from a simple two-station inter-com to a 200-line dial telephone system and included a multitude of auxiliary signaling and sound

(Continued on page 22)

Onan Electric
full power after

Typical Onan torture test—tougher by far than normal usage—proves Onan's ability to deliver on any job.

Generous design assures longer life—Husky Onan has double the bearing area of many equivalent rated engines . . . plus larger, stronger crankshaft to minimize breakdown and to give you longer, trouble-free service between overhauls.



Exacting standards govern manufacture—Years of specialized experience and extensive testing facilities control the quality of Onan Power Plants. Over 1000 different types and sizes of plants are produced by this same, careful method at Onan.

Plant still delivers 12,197 hour test run!

Run equivalent of 487,888 miles... killed and started... tortured, tested, retested... Onan Test Plant #1068 still delivered full-rated power

A grueling endurance test that lasted one year, nine months and 12 days could not stop Onan Test Plant #1068. Development engineers used this production-built unit as a testing laboratory. And after it was all over, it still generated the full rated power promised on the nameplate. Proof that Onan's exacting standards and production testing give you a power plant with long, dependable service built in.

Over 1,700 other endurance tests have been run by Onan development engineers. Here's where every design feature and part had to prove itself before it could become a part of the Onan you buy. In addition, every type and size Onan Plant is tested under all operating conditions which affect its performance.

Hours of running in and testing under load are given every Onan before it is shipped. An independent testing laboratory retests Onan-tested Plants and certifies Onan testing methods—double assurance that every Onan will deliver its full nameplate rating. Only then does an Onan qualify for its Performance Certified Guarantee.

You buy *proven* performance when you buy an Onan Plant. See your Onan representative. You'll find his name in the telephone classified section in every major city, or write direct.

ONLY ONAN GIVES YOU THIS CERTIFICATION

PERFORMANCE CERTIFIED
We certify that when properly installed and operated this Onan electric plant will deliver the full power and the voltage and frequency regulation promised by its nameplate and published specifications. This plant has undergone several hours of running-in and testing under realistic load conditions, in accordance with procedures certified by an independent testing laboratory.
D. W. ONAN & SONS INC.
Minneapolis 14, Minnesota
Onan

Onan®

World's Leading Builder of Electric Power Plants

D. W. ONAN & SONS INC., 2588 UNIVERSITY AVE. S.E., MINNEAPOLIS 14, MINN.

distribution systems. This ad set forth that the equipment could be purchased outright or leased for a monthly rental charge.

Almost every day, some literature crosses my desk from some company promoting some form of inter-com system for the home or office. Many of these systems offer relatively good service, but any telephone company can furnish inter-com systems that offer superior service, with features that are only provided by the telephone company, which maintains the equipment properly and promptly through qualified service technicians.

Competition a Reality

Another large manufacturer, whose stock is listed and traded regularly on the New York Stock Exchange, recently ran a full-page ad in the *Wall Street Journal* promoting its system of data processing, which makes it possible to transmit business records over regular telephone lines. A visit to any business show, or convention will confirm the fact that competition in the communication field is a reality.

Private microwave systems now consist of over 30,000 miles of channels, which produce five times as much revenue as all the private line service presently furnished by Independent telephone companies.

A lease-maintained proposal for micro-wave is available to any business which may feel the need of point-to-point communication. Such service is available from not one, but several sources.

The Columbia Gas System has started construction of a 29-station, 470-mile micro-wave communication system, under contract with a large manufacturer of micro-wave and radio equipment. This system, when completed, will cost over 1.5 million dollars. The system will provide voice communication, teletypewriter circuits, facsimile telemetering, supervisory control and data communication facilities, and will reach into upwards of a dozen different states.

Railroads Went Through It

Take a look in the Yellow Pages of your telephone directory under "Intercommunications." You may be surprised how much competition exists today in this field right in your own service area.

We are in about the same position today as the railroads were in this country 50 years ago. At that time, if one wished to make a trip of more than a few miles; there was no question as to his method of transportation—it would be by rail. I need not enumerate the developments in the field of transportation over the past half century which have resulted in serious competition for the railroads. I merely cite the railroads as an example of what could well happen in the telephone business, should we become careless and not meet immediately and properly the threats of competition in providing communications service to the public.

Our manufacturers are developing the tools to provide almost any type of communication our customers may need. We have the means to meet head-on, competition from private outside sources if we will only recognize that the competition exists and is certain to increase as time goes on.

Only recently a woman remarked to me that she wished she could get her washing machine and other appliances repaired as promptly and easily as she could her telephone. Right there is the advantage we hold.

Must Develop Initiative

This is an era of service. Today, we have the skill and know-how to render the finest and most adequate communication service that is humanly possible to provide. Furthermore, manufacturers are fast to develop new methods and equipment with which we can provide any communication service the customer desires in the future.

The biggest challenge we telephone people face is developing the initiative to anticipate our customers' every need for additional and new communication service. It is essential that we must think in terms of types of service suited to the needs of every person, and make every effort to provide it.

For example, mobile radio-telephone service has great sales appeal to prospective subscribers. Many of us feel it is too complex and costly. Dial mobile equipment is here and its use will increase until it will become commonplace. It is flexible and can be expanded easily. However, it does have limitations which are not generally known by the average potential customer, and the rates necessarily are high, compared to those required for wire line service. It will no doubt be an unprofitable field for some time, but that must not prevent us from entering this field just as soon as we can find enough customers for a minimum installation.

Farms Are Good Markets

About one-half of our customers are farmers. For many years we have thought of the farm as a place needing only one telephone and with little or no long distance service being used. We have recently discovered that the farm offers a greater potential for extra telephone services than the urban residence. A few examples are extensions, not only in the farm home, but in outbuildings, intercom from barn to house, loud signal units, private lines, etc.

The smaller one-man businesses seem to be especially good prospects for telephone answering devices. Loudspeaking telephones find a ready acceptance in places where markets or quotations are received by telephone and writing at the same time is necessary.

Our company has a "no-hands" telephone installed in a service station which is run by an elderly gentleman. His cronies come to the station to play cribbage with him, and when one of them receives a call, he doesn't have to move away from his card game to answer. It is no passing fancy as he has had this "no-hands" telephone for over five years. The miracle of today becomes commonplace tomorrow, and you never can tell who wants what, and where.

Let's Meet Competition

Does anyone in your office ever turn someone away with the remark, "We are sorry, we don't provide that service?" Regardless of the type of communication service the customer may have in mind, we should listen to his problem and discuss it with him, then exhaust every possibility of providing the service he wants before giving a negative answer. If he wants a polka-dot extension telephone, or mobile service for his son's bicycle, let us endeavor to provide it. These are the frontiers of our future opportunities.

It has been said that locking the barn door too late is the occupational disease of mankind. For example, the luxury of modern railroad transportation, accompanied by the employe's improved attitude toward customers has arrived too late for railroads to compete with the champagne flights of many of the airlines. This is the history of more than one industry, and of the human race, because we usually do not do what we should have done until it is too late.

It is possible for Independent telephone companies, both large and small, to meet competition and to provide the communication services the customer needs.

This is not just a problem of the large telephone companies serving metropolitan areas, but competition is facing the smaller companies, too, particularly those serving areas in which industrial organizations have built plants and offices. Not only will these industrial firms demand and expect to get all the modern types of communication services available, but the people

(Continued on page 53)

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

AT ONE TIME, a lot was said about retiring to the "old rocking chair." Some even said that they would just "sit" for the first six months and then begin rocking.

This has all been changed in recent years and last year, the age group which was issued the largest number of passports for travel abroad was the 60-76 year-old bracket. People in their fifties were in second place.

Not all retired engineers and technicians, however, become world travelers. Many seek new positions where their knowledge proves invaluable in the training of younger workers. Others obtain positions as consultants where their knowledge gained from years of experience can be utilized to advantage.

We will wager that a new interest and a new position would prove a greater stimulus to many of these oldsters than they could derive from world travel.

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The Pacific Telephone & Telegraph Co. reports that last year they spent more than 73 million dollars for forms, reports, and papers used in running its business. Furthermore, as the telephone business increases in scope and complexity, more forms, reports and papers seem necessary.

It has been estimated that if the current rate of paper work costs continue, in 10 years, this company could be spending 133 million dollars per year for this phase of the business.

This problem is being attacked through the Pacific company by departmental specialists, task forces, and interdepartmental committees. These committees meet regularly to review progress in the widespread activities; to coordinate the company-wide program, and to modernize and simplify necessary paper work. The objectives of this campaign are: To help the business employ its people more profitably, to make their work easier, and to help meet the unprecedented demands of the future of the telephone business in the Pacific Telephone area.

The reduction of paper work, and its tremendous cost, is a problem faced by everyone in the telephone business today. Dr. Werner von Braun, the eminent missiles scientist, refers to this problem as follows: "Our two greatest problems in space are gravity and paper work. We can lick gravity, but sometimes the paper work is overwhelming."

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A representative of a large operating company informed us recently that they have discontinued maintaining trouble records on subscribers' line record cards.

The wisdom of this practice was questioned, as we have always been of the opinion that this record can be used to advantage when a trouble repeats on a subscriber's line. This company states that when a subscriber has recurring trouble, he will furnish complete information, so why go to the expense of maintaining a record? Perhaps, there are many records maintained at considerable expense that never serve any useful purpose.

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The new "Card Dialer" is now undergoing a field trial with 90 customers in the Birmingham, Mich. area.

Officially described as a "Card-Operated Repertory Dialer," the new equipment, activated by a small card, does the dialing for the customer. About the size and general appearance of a small toaster, it is connected to the subscriber's set by a cord, in the same manner as the Speaker-Phone.

The user is supplied with 2 x 4-inch cards. He records each frequently-called telephone number on a separate card by punching two holes for each digit of the number. This can be done with a pencil point.

To dial a number, the user picks out the correct card, inserts it in the dialer (it is like placing a slice of bread in a toaster), lifts the handset, listens for dial tone, and depresses the bar of the dialer, which then does the rest of the dialing operation. The subscriber's set is not altered in any manner, and the subscriber may use the regular dial instead of the dialer at any time.

Ninety customers—60 residence and 30 business—have been selected in Birmingham for the trial. They will use the dialer for several months until sufficient data have been obtained to permit the Michigan Bell and the Bell Laboratories, developer of the device, to evaluate its convenience and reliability.

The Birmingham, Mich. area was selected for this trial because it meets all the requirements for testing the dialer. The exchange has nationwide DDD, Automatic Message Accounting (AMA), and a better than average local and long distance calling rate.

The "Card Dialer" is still in the experimental stage and is not yet available to the general public. The results of this field trial will determine whether the device will be made available to all customers of the Bell System.

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We hear numerous stories of late about spiked heels worn by the ladies causing accidents and damaging floor coverings.

Small wonder, for it is claimed that a 112-pound lass on spiked heels exerts, while walking, 4,000 pounds of pressure per square inch, while a 224-pound man wearing regular shoes places only 24 pounds pressure on a square inch.

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Worry is claimed to be as useless as a whisper in a boiler factory.

Annual Review of

NEW PRODUCTS AND TECHNIQUES

By RAY BLAIN

THIS is the third article in a series describing various new items of equipment and their application in telephony.

The second article appeared in the June 11 issue.

Readers desiring additional information on any of the products described, should write the manufacturer or TELEPHONY.

* * *

Typing Reperforator Tape Punch (Fig. 25)—This typing reperforator, by Teletype Corp., consists of a tape punch and printing mechanism actuated by incoming line signals to perforate information in tape. The contents of the resultant five-level printed chadless tape can be identified quickly even by personnel untrained in reading code combinations. This typing reperforator is designed to operate at 100 WPM. Gears are available for lower speeds. An optional accessory gear shift mechanism permits instantaneous manual switching from 100 to 60 or 75 WPM. Its operation is fully automatic except for replenishing the tape supply and pushing the "On-Off" switch. Both visual and audible "replace-tape" alarms are available.

•

Transistorized Coin Collect and Return Power Supply (Fig. 26). The Lorain Model T7T transistorized coin collect and return power supply operates from 48-volt office battery and supplies 120-volt dc positive and 120-volt dc negative outputs at .250 ampere. The unit will withstand momentary 100 per cent overloads and is well-filtered and well-regulated. Silicon rectifiers are used. Output failure relay furnishes ground to two external alarm circuits. Other ac operated models are available.

Fig. 26. Transistorized collect and return power supply.

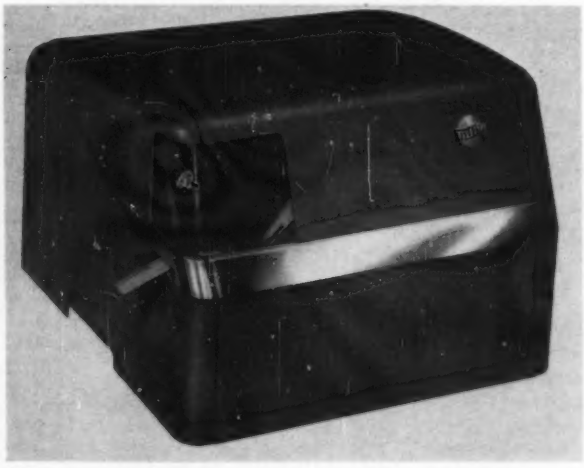

Fig. 25. Typing reperferator tape punch.

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Meter Transfer and Alarm Panels (Fig. 27). The Lorain line of meter, alarm and automatic transfer panels—Types A, B, C, D, E, F—are designed to supervise frequency generating installations utilizing up to five frequencies. Some models provide automatic transfer to a standby unit when the main unit fails, thus providing uninterrupted service. This line of supervisory units has been designed to accommodate all of the wide variety of supervisory requirements arising in the supply of telephone ringing frequency and voltage. (Cut on page 25.)

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Test Load Unit (Fig. 28). Two models of the Lorain test load units are available. Model Y1 simulates a load of 1 ampere to 150 amperes in the 50-volt range and 2 amperes to 300-amperes in the 25-volt range, while Model Y2 simulates a load of 1 ampere to 150 amperes in the 50-volt range and .7 ampere to 65 amperes in the 130-volt range.

These units are ideal for use by installation crews for testing batteries and to simulate a predetermined equipment load before cut-in. (Cut on page 25.)

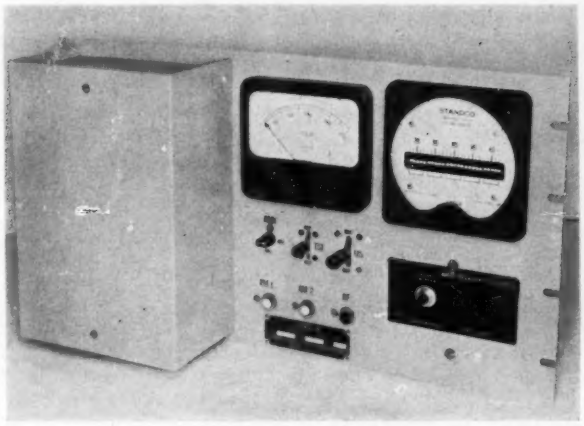

Fig. 27. Meter transfer and alarm panel.

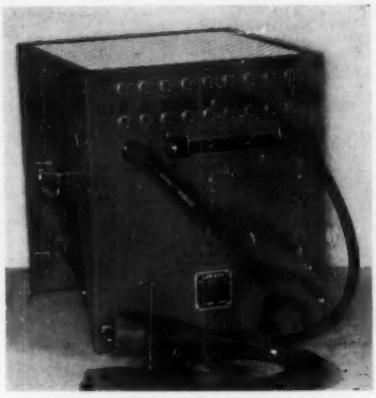

Fig. 28. Test load unit.

Electronic Interrupter (Fig. 29). The Lorain Model N electronic interrupter presents, for the first time, a completely static, trouble-free interrupting system and is made up of a combination of standard pulse generators, pulse frequency dividers, translators and

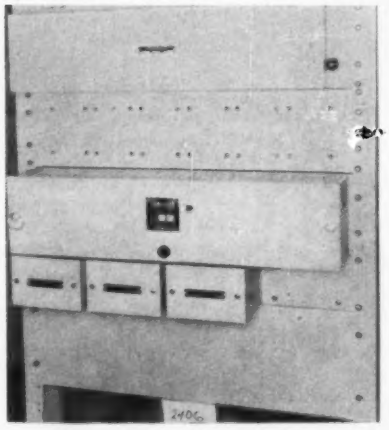

Fig. 29. Electronic interrupter.

gating units, the rearrangement of which provides a wide variety of tone interruption and ringing patterns. The unit may be used with existing frequency and tone equipment as well as with the Lorain transistorized sub-cycle frequency generating units and the Lorain transistorized tone generators.

•

Transistorized Tone Generators (Fig. 30). The Lorain transistorized tone generators include Model F1, supplying 600/120 cps. dial tone; Model G1, supplying 500 cps. high tone, and Model H1, supplying 420/40 cps. audible ringing tone. These models all operate from office battery drawing .17 ampere and supply output of 400 milliwatts. Model J1 transistor amplifier is available to increase the output of 5 watts. Also available is transistor Model F2 supplying 600/120 cps. at 25 milliwatts adapted for mounting on a 1¾-inch relay rack bar.

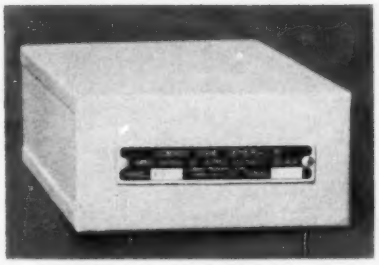

Fig. 30. Transistorized tone generators.

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Bat-Tap Voltage Reducer (Fig. 31). The Lorain Bat-Tap voltage modifiers are transistorized dc units enabling office battery voltage to be changed without tapping the battery. Thus, uneven cell discharge is avoided. These units avoid the power losses experienced with resistors and counter EMF cells. Operating from 48-volt office battery, Model QB15A supplies 24 volts dc, Model QB15AB supplies 20 volts dc, while Model QB15M supplies 12 volts dc. Also available are Model QB15A2, provided with paralleling leads so that two units may be installed to share the load, either one serving as standby should the other fail, and Model QA7B which, operating from 24 volts dc, supplies 48 volts dc.

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Carrier Supply Units (Fig. 32). Lorain transistor carrier supply units are available in two models, Model CST1 which supplies 130-volt 2.0-ampere plate current for multiple channel use, and

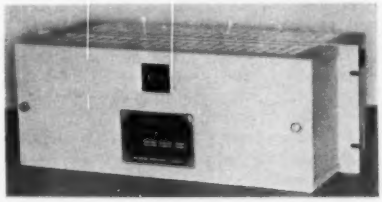

Fig. 31. The Bat-Tap voltage reducer.

Model CST2 which supplies 130-volt, 150-milliampere plate current for single channel use. These units are well-regulated and both are filtered to avoid noise in the talking battery and in the load circuit. Full load input current for Model CST1 is from 8 to 9 amperes, and for Model CST2, it is .78 amperes.

Fig. 32. Carrier supply units.

Both units are compact and designed to 19-inch relay rack mounting.

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Twenty-Cycle Transistorized Ringing Converters (Fig. 33). The Lorain line of single frequency (20-cycle) Sub-Cycle ringing converters is transistorized and includes models which operate from 24-volt, and other models

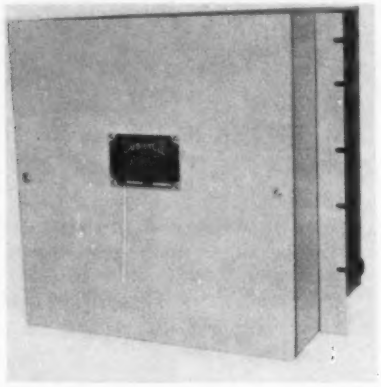

Fig. 33. The 20-Cycle transistorized ringing converter.

which operate from 48-volt office battery. Each of the above classes of units includes models providing 7.5, 25, and 50-watt output to accommodate various exchange load requirements. Models are available for both wall and relay rack mounting.

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Power Supply Units (Fig. 34). These power supply units operate from a 115-volt, 60-cycle source. The two models, ideal for PBX installations, are compact and designed for either wall or

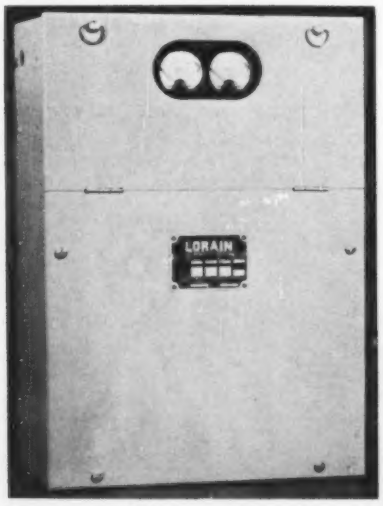

Fig. 34. Power supply unit.

rack mounting, and are readily adaptable to private communication installations found in industry and institutions. Both models provide 24-volt dc talking power, 6A1 at 6 amperes, and 12A1 at 12 amperes. Voltage regulation and filtering is provided. Both models provide 60-cycle signaling power output—Model 6A1, 10 volts at 115 amperes and 20 volts at 1 ampere; Model 12A1, 10 volts at 30 amperes and 20 volts at 2 amperes. Both models supply 95-75-volt, 20-cycle ringing power rated at .100 amps. Reverting tone is provided.

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PBX Power Supply Unit (Fig. 35). This power supply unit is ideal to provide talking, ringing, and signaling power for small dial PBX installations. The unit is designed to sit on the bat-

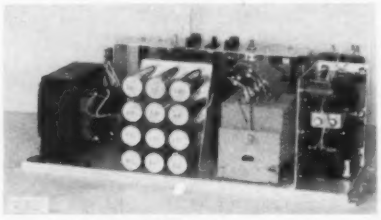

Fig. 35. PBX power supply.

tery tray so that space problems are eliminated when the conversion is made. The unit operates from 115-volt, 60-cycle source and is filtered and regulated. The 24-volt talking output is rated at 4 amperes continuous and 8 amperes intermittent. The 10-volt, 60-cycle signaling output is rated at 15 amperes, and the 20-volt, 60-cycle signaling output at 1 ampere.

The 90-75 volt, 20-cycle ringing output is rated at .050 ampere.

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Transistorized Ringing Converter (Fig. 36). This ringing converter, like the Lorain Model T, comprises five identical, interchangeable plug-in, transistorized frequency generator units which are individually adjustable through both coarse and fine frequency adjustment to provide any five desired frequencies. A common equipment unit, including filter, remote control relay, audible ringing tone generator, and power amplifier, comprises the sixth plug-in unit. The Lorain Model T50 ringing converter supplies 50 watts per frequency.

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The Autodial (Fig. 37). The Hayes Autodial enables the busy executive to dial quickly, by pushing one button, those pre-selected numbers which he

Fig. 37. The Autodial.

most frequently calls. Simplicity of design, ease of setting up and/or changing numbers was the prime criterion utilized in developing 'his instrument, according to the Hayes Aircraft Corp.

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The Autotel (Fig. 38). The Hayes Autotel is an automatic, loudspeaker

(Continued on page 42)

Fig. 36. Transistorized ringing converter.

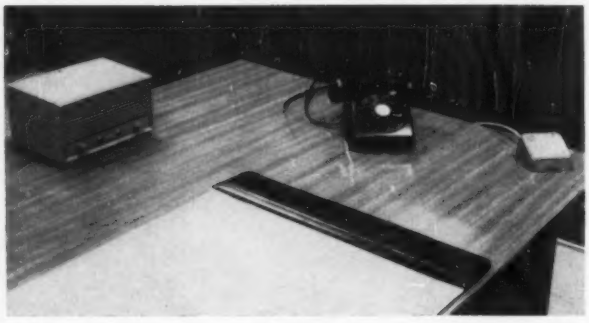


Fig. 38. The Autotel.

CARRIER CONSIDERATIONS

WITH THE INCREASING demand for telephone communications by private industry and government, along with normal commercial telephone traffic, physical plant has become heavily loaded with open wire and cable carrier systems, with the future calling for additional systems. Each of these communication paths creates a potential source of crosstalk.

CROSSTALK MEASUREMENTS

In many instances, in order to insure crosstalk freedom between communication systems, it will be necessary to perform crosstalk measurements. It then becomes necessary to select pairs of open wire or cable which provide the required freedom from crosstalk; or, at the time additional systems are to be installed, to perform the necessary means of reducing the crosstalk or its effects.

Crosstalk between disturbed and disturbing pairs of cable or open wire transmission lines can be divided into two significant classes: near-end and far-end. When energy from the disturbing pairs is coupled into the disturbed pairs and detected at the end opposite the signal source on the disturbing pairs, it is referred to as far-end crosstalk. That detected on the disturbed pairs at the same end of the coupled section as the signal source is referred to as near-end crosstalk.

Crosstalk is significant insofar as it interferes with the privacy of telephone conversations, or appears as a form of noise. The ratio of desired signals to undesired crosstalk signals takes on basically the same significance as signal-to-noise ratios, which were discussed in a previous article.

In performing crosstalk measurements, the following equipment is desirable. Other equipments having different calibrations may be used however, providing proper conversions by use of appropriate conversion tables; or formulas are used in obtaining desired results.

(1) *Frequency Selective Vacuum Tube Voltmeter* capable of measuring frequencies within the range to be considered, providing the accuracy desired, and having proper calibration; that is, a meter which is calibrated to indicate 0 db when bridged across a 600 ohm load having a voltage drop of approximately .773 volts.

a) Crosstalk coupling loss is expressed in db and further, in the telephone industry, 600 ohm loads or terminating impedances are largely a standard in intertoll trunk design.

(2) *Oscillator* capable of generating frequencies within the range to be considered, providing adequate output power, having desired output impedance and giving accuracy desired.

(a) The desired output impedance in many instances is 600 ohms for the same reason given in a previous paragraph.

b) Adequate output power as stated above may be considered as an amount of power which will produce a meter indication 15 to 20 db greater than any noise power measured on the disturbed circuit at the point where crosstalk measurements are to be performed.

Prior to performing crosstalk measurements, it is necessary to provide adequate impedance matching where required and to terminate the transmission line in its characteristic impedance as is done in making noise measurements (See Electronics Section, Apr. 30 issue.)

Let *Fig. 1* illustrate a disturbed and disturbing circuit. Assume pair A-B to be designated the disturbing circuit with terminal A representing the near-end and B the far-end; also

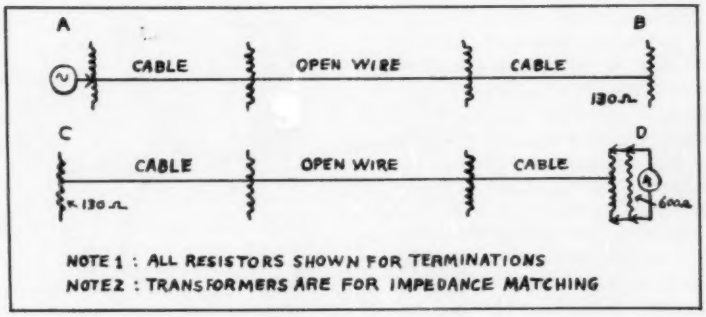


Fig. 1.

assume pair C-D to be designated the disturbed circuit with terminal C representing the near-end and D the far-end.

Let it be desired to determine the amount of far-end crosstalk coupling loss from terminal A to terminal D. Shown in the figure is the arrangement of the various items of test equipment and impedance matching equipment. If transmission loss measurements are made at a given frequency from terminals A to D and from terminals C to D, then the decibel difference of these two measurements is representative of the amount of far-end crosstalk coupling loss from line A to B to line C to D.

In most instances, crosstalk measurements made between A-B and C-D will differ from those measurements C-D and A-B. For this reason crosstalk coupling loss measurements should be made in both directions.

In order that a noise power at a particular frequency is not a significant portion of the total power being measured (thus introducing error), the difference between the measured readings at any frequency—with the oscillator on and then with the oscillator off—should be at least 15 to 20 db; otherwise it will be necessary to separate the power of the noise from that of the crosstalk by using proper charts or formulas.

Many carrier systems use different frequencies in opposite directions or utilize separate cables in opposite directions, thereby causing the far-end crosstalk to be controlling. Then, too, crosstalk advantages are gained by frequency staggering and frequency inversion, thereby effectively increasing crosstalk coupling.

These built-in conditions thus assist in meeting crosstalk objectives without the added expense of improved transposition systems, improved balancing, nor, quite often, the use of compandors.

Depending upon the nature of the service to be provided, crosstalk coupling losses on the order of 50 to 60 db should prove satisfactory.

DATA TRANSMISSION

IN MANY of the previous articles, we have attempted to bring to light the growing importance of data transmission. We have also attempted to present to our subscribers new developments within this branch of communications.

The Stromberg-Carlson Division of General Dynamics Corp. has recently announced the development of a new high speed binary data transceiver that will make it possible for electronic computers and other high speed data handling units to "communicate" directly to one another over standard commercial telephone circuits at a rate of 2400 bits per second.

Stromberg-Carlson's high speed data transceiver, Model S-C 301, which will transmit and receive binary data over commercial telephone circuits at a rate of 2400 bits per second.

The company stated that this high speed in data transmission is made possible principally by a unique modulation process which minimizes error normally created by impulse noise, phase distortion, frequency translation and the other problems normally encountered in transmission of intelligence on telephone facilities.

Stromberg also said: "In operation, the transceiver accepts the data from a source, in the form of a train of pulses, shapes the pulses, and modulates a subcarrier frequency.

"No synchronizing signals are necessary, as the receiver portion has an automatic frequency control system for automatic frequency synchronization at any bit-frequency between 2350 and 2450 pulses per second."

Higher or lower bit rates can be provided on special transmission facilities by substitution of plug-in components. Full duplex operation is also made possible, where four-wire facilities are available for transmission.

OVER-THE-HORIZON TRANSMISSION

INTERNATIONAL Telephone & Telegraph Corp. recently announced it has set-out to build one of the world's largest microwave communications spans in the Pacific area.

Designed to bridge an ocean expanse of some 500 miles, the link will employ newly developed over-the-horizon radio equipment using the relatively new microwave propagation technique known as "tropospheric scatter." In this type system, transmission is made possible by beaming powerful signals against

the tropospheric layer, which in turn reflects the signal back to earth.

Although locations of the two terminals were not made public, it was stated that the Pacific system would employ 60-foot parabolic antennas and would operate with 10 kilowatts of power.

The key to the increased range of the link is the use of parametric amplifiers.

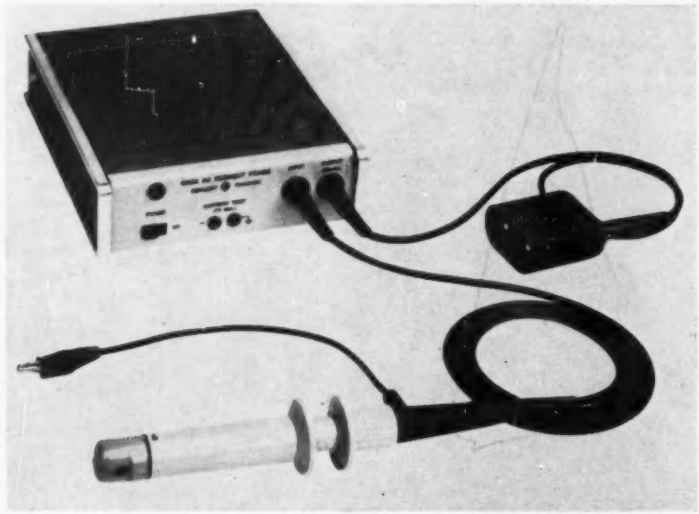
MEASURING DEVICES

A NEW DEVICE which appreciably simplifies ac current measurements has recently been developed by Hewlett-Packard Co.

The instrument, model 456A, which converts ac current to ac voltage for observation on an oscilloscope or ac voltmeter, uses a probe which simply clamps around the current-carrying wire. The instrument has a unity conversion of 1 Ma. to 1 Mv. thus making it possible to read directly in milliamperes on voltmeters or oscilloscopes.

The instrument's wide bandwidth (20 cps. to 15 mc.) also permits oscilloscope viewing of complex current waveforms with rise times as fast as .08 microseconds.

Typical applications consist of measurements made in operating circuits of transistors, vacuum tubes, and various other electronic circuitry.



Hewlett-Packard model 456A ac current probe.

TELEPHONE ISOLATION DEVICES

MANY TELEPHONE companies have in past years installed considerable cable. Much of this cable has been used for providing exchange area service. As a matter of economy, it was deemed necessary to include considerable "bridge tapping" or multipling of this cable. That is, a main cable was extended from a central point in several directions to serve the many widely scattered subscribers or to serve as a flexible arrangement in order to make it possible to take care of any unexpected construction developments without resplicing plant cables. Then, too, quite often there are several spans of drop-wire from connecting terminals of party lines to served subscribers, giving similar effect.

The effect of bridging and multipling is a transmission distortion impairment due to increased shunt capacitance. The more important consequence of such a design method, and resulting transmission impairment, is poorer intelligibility, rather than talker volume. This means for the most part loss of the higher voice frequencies rather than the lower voice frequencies.

In the present state of the art, limitations have necessarily been placed on the amounts of "bridge tap" capacitances that can be tolerated. Meeting these objectives quite often becomes costly. It may mean larger-sized cables and more lines of equipment.

Recent developments have made it possible to effectively remove electrically the "bridge taps," while in reality maintaining them.

Although many of these presently available devices operate on different principles, they effectively achieve the same function; that is, as stated above, to effectively isolate electrically branches which normally would affect transmission.

One type of telephone isolation device known as the TID-4, and manufactured by the Orbit Industries, Inc., utilizes the recently developed

diode switch to effectively remove "bridge tap" effects.

In a typical party-line service, which uses a telephone isolation device, during the period that a particular subscriber has the telephone instrument in an "off-hook" condition, this subscriber is effectively the only subscriber connected to the telephone line, with the other subscribers effectively disconnected. As a result, the capacitance of the other subscriber bridge taps is not felt, and, during this period, transmission is effectively private-line design.

In general, many of these "bridge tap" lifters being developed may be utilized for:

(1) Isolating branching drops in off-premises installations.

(2) Electrically removing "half-taps" during cut-over periods.

(3) Isolating bridging of pairs at the central office.

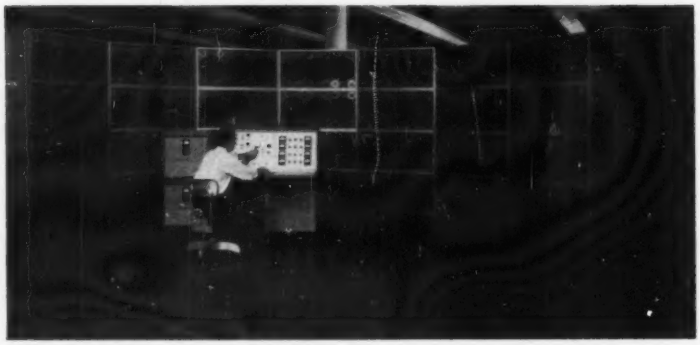
(4) Isolating bridging of pairs between load coils.

(5) Isolating bridging of more than one branch line to single feeder line.

SOUND

STROMBERG-CARLSON Division of General Dynamics Corp. recently announced that it had delivered to the Air Force a large high-intensity acoustical system.

The system was developed by Stromberg-Carlson for the Aerospace Medical Division of the Wright Air Development Division, and will be used in testing the physiological effects of high intensity sound. The "business end" of the system is a huge assembly of loudspeakers—480 in all—mounted in 32 separate baffles for maximum flexibility in arrangement and control. Each baffle contains three low frequency "woofers" and 12 high frequency "tweeters."



Stromberg-Carlson acoustical engineer makes preliminary test—at low power—of big array of loudspeakers destined for Wright Air Development Division, Ohio. There they will be a key part of a large, high-intensity sound system being used in studies of the physiological effects of high-intensity sound.

The system is controlled from a console providing four possible inputs—sine wave, electronic "white noise," tape recordings, and an external source. The main audio power equipment consists of two pairs of audio amplifiers. Each of the pair of high-power amplifiers has an output of 7,000 watts. Frequency response of the system is flat over the entire audible range, from 20 to 20,000 cycles per second.

ELECTRONICS BOOKS

FUNDAMENTALS OF SEMICONDUCTORS

By Marcus G. Scroggie; $2.95.

The author, educated at George Watson's College in Scotland, from which he received his B.Sc. in Electrical Engineering, is well-known in England for bringing to technical writing a smooth and facile prose style.

Many technicians are aware of the developments and applications of the uses of semiconductors, but very little literature on the subject has been written which is understandable without an advanced knowledge of physics and mathematics; or, in the other extreme, the literature is often so simply presented that much of the real concept is never communicated. This book eludes both categories, and is highly informative.

Granted, new developments and new applications are certain to take place and many existing semiconductor components may not survive. In light of this, the author discusses both the presently-used semiconductor components as well as a majority of the newly developed ones.

Various chapters explain functions,

potentialities, and theory of such components as transistors, varistors, masers, marvars, thermistors, to mention only a few that are discussed.

You may order this book from TELEPHONY.

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CONTROLLED RECTIFIER MANUAL

Published by General Electric Co.; $1.00.

This 255-page manual was written by a group of application engineers of the GE's Semiconductor Products Department, who specialize in assisting customers in the use of the silicon controlled rectifier in various circuitry.

The manual is intended to give the circuit designer the necessary detailed data to make application of the components within their specifications.

Orders for this book should be sent to General Electric Co., Semiconductor Products Dept., Advertising and Sales Promotion, Charles Bldg., Liverpool, N. Y.

Real Adventure

"Something akin to security mania grips millions of Americans these days," the Norwalk (Conn.) *Hour* observed in a recent editorial.

The *Hour* adds that "it is sad that young men starting out in life" should be so heavily oriented towards retirement.

Understandably, realistic planners, including young people, must give serious thought to security. A middle ground, however—of neither over-emphasis on building personal security nor of fear to tackle the problems of the future, when it arrives—seems to be suggested by the Connecticut newspaper.

The *Hour* reminds its readers, this country was founded by adventurers. (That the founders also planned wisely is obvious.)

Rather than over-emphasize security, and dwell prematurely upon "sunny verandas and retired ease," the *Hour* appeals to us "to fight tomorrow's anxieties" *when they arrive*; meantime, live fully.

Perhaps, the *Hour* would also add: live prudently, and with faith in our country's future.

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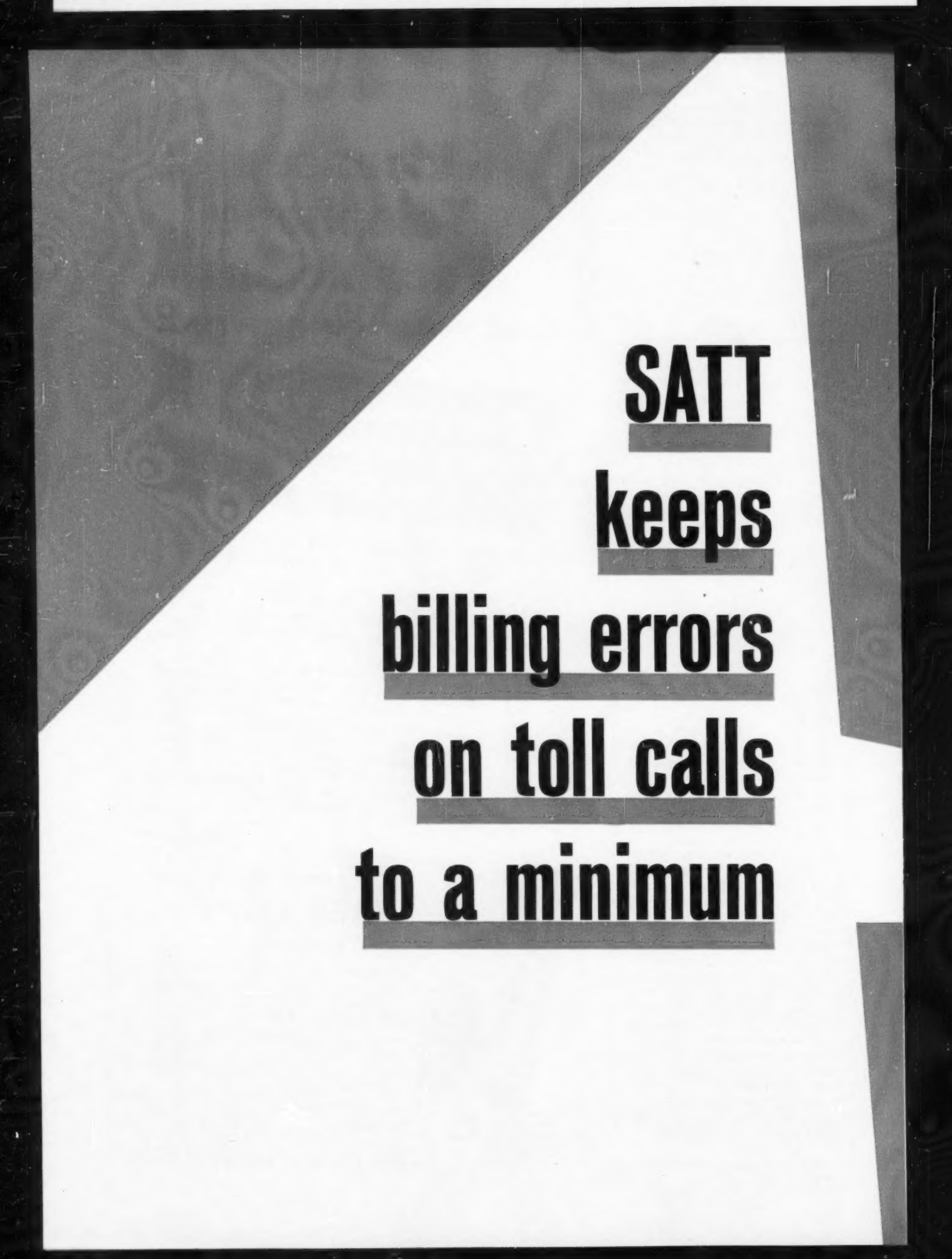
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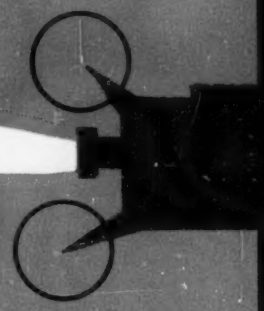

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Officers and directors of the Illinois Telephone Association. Back row, left to right: R. P. Reuss of Springfield; R. M. Wopat of Bloomington; Graydon Trout of Chicago (guest); Ben B. Boynton of Springfield, general counsel; M. A. Kugler of Okawville; Don Anderson of Geneseo, vice president; A. T. Renn of Chicago; James Stice of Altamont, and Ray J. Alter of Galesburg, treasurer. Front row, left to right: F. S. Coakley of Dixon; R. W. Britt of Bloomington; O. M. Westrup of Mattoon; K. L. Schroeder of Freeport; Roland Schmidt of Jacob; Daniel Schaefer of Sycamore, president; J. G. Hardy of Springfield, secretary, and Russell Logue of Casey. (Convention photos by Fred Addis of Bloomington.)

Illinoisans Hold 55th Convention

By R. C. RENO

MORE CONSIDERATION of human values and enlightened leadership are two factors which the telephone industry needs to stress if it is to continue to adequately meet the communication needs of the American people, K. L. Schroeder, president of the Illinois Telephone Association, declared in opening the association's 55th convention in Springfield, held on May 18, 19 and 20.

The convention started with a golf tournament followed by a dinner attended by 215. Registration for the convention totalled 425.

"In searching for keys to unlock the chest of business success, the master key is labeled *human values*, and a second important key is tagged *enlightened leadership*. I believe both of these keys will open the chest if we will only try them. And, I believe they will enable telephone companies to do a continuing better job in rendering service," Mr. Schroeder said. He continued:

"People were not created to travel on railroads, airplanes and ships. These services were created to serve people. Telephone service was created to serve people. If management consists of getting things done through people, then the more people do, the better the job management is doing. Thus, management is a developer of people."

In discussing the elements of human values, as they apply to management, Mr. Schroeder presented several guide lines:

(1) Management must inspire employes to be better workers and to do better jobs.

(2) Management must maintain an atmosphere in which subordinates and workers feel free to talk to top officers as well as to each other—in other words, maintain an open-door policy.

(3) Employes must be continually kept informed of company policies and the reasons for actions taken by their companies.

(4) Management must be a good listener in discussions with employes and supervisory people. Attention to what its people have to say will provide management with an understanding and insight upon which decisions, tempered by reason and fairness to all, can be made.

(5) Employes must have adequate incentives and rewards in order to stimulate motivation to do a better job. Incentives and rewards must be kept in balance with performance at all times.

(6) Management must give recognition and credit to employes for good performance. Recognition of the importance of and the satisfaction that comes from any job well done is of great concern to employes.

In connection with enlightened leadership, Mr. Schroeder listed these qualifications:

(1) Management must keep abreast of and adopt new ideas and developments that will produce trouble-free service, save the company's money, and help employes do a better job.

(2) Enlightened leaders must be willing to take responsibility and necessary risks. The world is full of people who are afraid to take responsibility or who continually follow the tried and worn methods of the past. A true leader must have the ability to go ahead in spite of failure.

(3) Enlightened leadership also is characterized by action. Every time a man puts a new idea across, he finds 10 men who thought of it before he did —but they only thought of it.

(4) Enlightened leaders maintain an open mind and eliminate pre-conceived ideas and prejudices in getting facts and information upon which to base judgments and decisions.

J. G. Hardy, secretary of the association, presented a full report of the organization's activities during the past year. He covered his own activities assisting member companies in appraisals, accounting, preparation of rate cases and several other problems confronting operating companies.

He commented particularly on the work of two of the association's committees.

The General Industry Coordination Committee held several meetings since the last convention, he reported, to

formulate a program for area subcommittees during the year 1960. This committee selected eight items of major interest that should be covered during the next three years, as follows: Merchandising, safety, legislative activities, public relations, highway programs as they affect telephone companies, dial conversion (to include DDD, seven-digit numbering and mark-sensing), operational planning, and commercial activities.

Telephone companies can make community relations work for them only if they work for community relations, Robert P. Reuss, Illinois Bell State Area vice president and general manager told the Illinois convention. "It's like being a good neighbor—you don't earn such a reputation unless you labor to deserve it."

"I want to be emphatic about one thing," he said, "nothing can compensate for poor service. Any company which turns out an inferior product or gives poor service cannot rectify this by excellent public relations or outstanding community relations. Good service is the cornerstone of public attitude and must be the basis of all community relations programs."

Community relations, said Mr. Reuss, are "everything we do and say which, from the community's point of view, serves the community's interests." Basic to this is customer relations, the points of contact between the customer and the company or the company's employe.

Good customer relations begin with internal foundations that are sound, he said. This means treating employes with respect and understanding, keeping employes informed, building better communications between supervisor and employe, and between employe and the public.

Mr. Reuss said that the over-all picture of community relations consists of serving, sharing, knowing, organizing, informing and prospering.

J. G. Hardy (left) and George R. Perrine, chairman of the Illinois Commerce Commission, get together for the cameraman at the Illinois convention.

"By serving I mean that we should provide efficient, friendly telephone service.

"Sharing means participating in worthwhile activities both as a company and as individuals . . . helping to solve community problems because they are also our problems." He continued:

"Knowing means being aware of how the community feels about us—what it thinks of us—what it expects of us. This means all segments of the community.

"When we mention organizing we are talking about giving local telephone people information, responsibility and opportunities to build better relations between the company and the community. The community living concept requires the care and cultivation of local initiative.

"Informing is most important. Our plan is to tell the community what we do and why, so people will understand our work and intentions.

"Last we come to prospering. We all know that a company which earns well serves well. A company that has adequate profits can, in the long run, provide the best service at the lowest possible cost. Such a company will have the necessary money to build for the long pull. There is nothing about our business which is going to insure its survival and health—other than reasonable profits."

Mr. Reuss pointed out the role of the telephone company in the community today. "Telephone service vitally affects every community," he said. "If we who run the telephone companies are not successful in working for the good of the community—from the community's point of view—then we are in for difficult times."

Finally, he pointed out that "the important thing is that we base our intentions on wanting to serve in a broad sense and work constantly in that direction, demonstrating genuine interest in the people and the community."

Another featured convention speaker was Reginald E. Kepler of Bloomington, Ill., marketing and sales manager of General Telephone Co. of Illinois.

"As we enter the 1960's, let's stop for a moment to catch our breath and see what lies in store for us. Shall we follow the same course with which we are accustomed and familiar? Will our past ways of doing things fit nicely and snugly into the explosive economic growth that economists unanimously tell us is upon us?

"We would do well, I think, to take a long hard look at ourselves, and our way of doing business. As our sale of primary services slows down, and as we continue to try to solve our problems by modifying what we have done in the past, let's ask ourselves—will this do the job? Will this meet the exciting challenge and the opportunities for growth and realization of a profit potential—that lie ahead? An honest self analysis will tell us that our old way of doing business may well fall short of what is expected of us, Mr. Kepler stated.

The term "selling," as it applies to the telephone industry today has an

These popular conventioneers are Mr. and Mrs. Paul Thoren of Chicago.

entirely new concept, Mr. Kepler said. It is a philosophy of business conduct —an aggressive approach to the market opportunity for telephone service; it is a concept aimed at consumer wants. It recognizes the principle that our customers' dollars will go to those who produce what people want, at a price that is both attractive to our customers and is profitable to the company. In other words, it is simply the active recognition of the importance of the customer and his needs and wants. He continued:

"Selling is a way to customer satisfaction. First of all, we must accept the objective of providing complete comprehensive service to each of our customers precisely when and where he wants it. With money to spend, customers dissatisfied with slowness of service, product inadequacy, or disinterest, will buy other products or services, from firms anxious and able to please.

"We must meet this competition on their own grounds. We must go to our customers, determine their needs, convert these needs to wants, and fill these wants by providing completely satisfactory and comprehensive communication service. We must persuade them to spend more of their discretionary buying dollars for our products and services, and in turn become satisfied customers through receiving comprehensive and complete communications service."

Acceptance of the concept of complete customer satisfaction, on the part of telephone companies, does not come easy. Full acceptance of this marketing concept requires decisive changes in many long standing procedures and ways of thinking. Gone is the attitude: "I'm afraid we're going to have some growth." Telephone companies must no longer think in terms of meeting service demand, but rather, they must dedicate themselves to determine what the customer wants, and meeting these wants with products and services, furnished at a profit, Mr. Kepler told his listeners.

"Selling then is an operating philosophy dedicated to complete customer satisfaction. It is a concept that believes that our opportunities for profit are bounded only by our effort and ingenuity. It is through this concept that the way is open, for a growth and realization of a profit potential in our business, far greater than ever available before," he concluded.

One entire afternoon was given over to a new feature of the Illinois convention—Round Table Clinics. Thirteen tables were set up and each was placed in charge of a panel of experts to lead discussions on the following subjects: Outside plant construction, engineering inside and outside plant, substation equipment, transmission, dial conversions, telephone directories, rates for new service, business office procedures, central office administration, dial equipment administration, traffic engineering, accounting, and Illinois Commerce Commission procedure.

Attending the golf dinner, preceding Illinois convention, were G. J. Edland (left) of Chicago, J. G. Hardy (center), Illinois association secretary, and Don Anderson of Geneseo.

During the convention the following directors were elected: R. W. Britt of Bloomington; F. S. Coakley of Dixon; Russell Logue of Casey; R. P. Reuss of Springfield; Daniel Schaefer of Sycamore; Roland Schmidt of Jacob; M. M. Wandrey of Des Plaines; O. M. Westrup of Mattoon, and R. W. Wopat of Bloomington.

Other directors are: Ray J. Alter of Galesburg; Don Anderson of Geneseo; M. A. Kugler of Okawville; A. T. Renn of Chicago; K. L. Schroeder of Freeport, and James Stice of Altamont.

Photographed at the Illinois convention were Ray Riordan (left) of Madison, Wis., secretary of the Wisconsin State Telephone Association and L. J. Neumeister of Glasgow, Ky., engineer, Kentucky Public Service Commission.

The directors elected the following officers: President, Mr. Schaefer; vice president, Mr. Anderson; secretary, J. G. Hardy; treasurer, Mr. Alter, and general counsel, Ben B. Boynton of Springfield.

Tharp to Succeed Hardy as Ill. Association Secretary

John F. Tharp of Chicago has been elected secretary of the Illinois Telephone Association to succeed J. G. Hardy, who will retire from that position on Aug. 1. Mr. Tharp will report to the association headquarters on July 5.

Mr. Hardy has served the Illinois association as secretary for 16 years. During this period, he has also been active in nationwide telephone industry affairs, working closely with the officers and committees of the United States Independent Telephone Association. He has been particularly active in rendering assistance to the smaller Illinois Independent companies in all phases of their operation.

Mr. Hardy has had long experience in the telephone industry. He entered the employ of the old Murphysboro (Ill.) Telephone Co. in August, 1913. He held various positions with that company, including ground man, lineman, wire chief and manager at Murphysboro until June, 1917, when he entered the United States Navy as an electrician. He was honorably discharged from the Navy in June, 1919, and returned to Murphysboro as manager. In June, 1928, he became district manager of the Illinois Southern Telephone Co., successor of the Murphysboro Telephone Co. He was advanced to commercial superintendent of the Illinois Commercial Telephone Co., suc-

(Continued on page 50)

5 REASONS WHY SUPERIOR I.M. DROP WIRE IS YOUR BEST BUY!

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Courts and Commissions

Ask Rehearing on Raise For General of Indiana

Public counselor George Diven on June 3 petitioned the Indiana Public Service Commission for a rehearing of its May 27 order granting the General Telephone Co. of Indiana a 2-million-dollar rate increase (TELEPHONY, June 18).

At the same time, the city council of Hobart requested a rehearing before the commission on the General company's rate increase request, on the ground that the Indianapolis hearing did not provide a convenient opportunity for Hobart citizens to testify.

Ask Permit Special Rates Neb. Military Facilities

The Lincoln Telephone & Telegraph Co. on June 14 asked permission of the Nebraska Railway Commission to apply special rates and charges for communication facilities furnished the armed forces for missile bases and other defense installations.

The application pointed out that these facilities often exceed in magnitude and complexity those offered for regular commercial service, and that such facilities are often located in remote places where no foreseeable regular commercial use could exist if the initial use were discontinued.

The company also said that such communications involve a higher than normal grade of maintenance and that usually, each installation must be specifically designed and engineered.

The proposed tariff states in part, "Since such facilities must be designed to suit the particular requirements and conditions involved in each instance, appropriate rates and charges will be developed to cover the applicable costs."

Tulsan Asks No. 1 Listing In SW Bell Directory

A Tulsa hauling company has petitioned the Oklahoma Corporation Commission, it was reported on June 9, for an order requiring the Southwestern Bell Telephone Co. to list its name as No. 1 in the telephone directory.

The name of the company is the "AAAAAAAAAAAAAAAAAAA A A A Trash Service," a title spelled with 23 A's.

The company has asked the trash service to drop a few of the A's, which it has refused to do. The trash hauling company states it will not list its telephone with less than the 23 A's.

Kansas Loan, Incorporation, Temporary Dial Rates OK'd

The Kansas Corporation Commission, it was reported on June 9, has granted approval to the Grainfield Telephone Co., to borrow $25,000.

•

The commission has also authorized Wamego Telephone Co. to incorporate under the name of Wamego Telephone Co., Inc.

•

In another action, the commission approved temporary dial rates for the Richmond Dial Telephone, Inc. for its Princeton exchange, which it is expected will be cut over to dial on June 30.

SW Bell Asks FCC OK To Buy 2 Kansas Exchanges

The Federal Communications Commission has set a July 21 hearing date on the application of the Southwestern Bell Telephone Co. to purchase the Suburban Telephone Co., Tonganoxie, Kans. (TELEPHONY, Mar. 26).

The Suburban company serves 800 subscribers through its Tonganoxie exchange and 400 through an exchange at Basehor.

Foster Laming is president of the Suburban company.

A Bell spokesman said that the acquisition will complement other Bell exchanges in the area, such as Lawrence to the west of Tonganoxie and Leavenworth, north of Basehor. Also, both exchanges are in the direction of future growth of the Kansas City metropolitan area, the spokesman pointed out.

Iowa Company Incorporates

Wilson Cornelius, president of the Andrew (Ia.) Telephone Co., on June 11 announced incorporation of the company, with himself and Hazel Cornelius, of Andrew, and Fred Cornelius of Maquoketa, Ia., as incorporators. The company serves approximately 230 subscribers, and plans to convert to dial early in 1961.

N.C. Court Rules Service Contracts Unconstitutional

The North Carolina Supreme Court on June 10 declared unconstitutional an act of the 1959 North Carolina State Legislature permitting telephone companies to provide service to municipalities free or at reduced rates (TELEPHONY, Dec. 12, 1959).

In this action, the North Carolina high court reversed a decision by Superior Court Judge Walter J. Bone, which upheld the act. The law sought to validate agreements by which companies have been providing free or reduced-rate service to cities, and which was ordered ruled out by the North Carolina Utilities Commission in 1958.

The cities of Rocky Mount and Wilson had appealed to the supreme court the commission's order directing Carolina Telephone & Telegraph Co. to discontinue giving towns service for their municipal government at reduced rates or free of charge.

Numerous other cities, it is reported, have been obtaining this service from companies, and the North Carolina commission threw the practice out on the grounds that it discriminates against other telephone subscribers.

The North Carolina Supreme Court held that rendering service to cities free, or at reduced rates, is discriminatory.

It further said, "A fundamental basis for the regulation of public utilities is to assure that once monopoly powers have been granted, the utility will provide all customers similarly situated with service on a reasonably equal basis" and that "the public interest is paramount over any contract the city may have for a lower rate."

The court also agreed with the commission that contracts calling for free service or reduced rates in return for use of city streets amounts to a tax, and such a tax is illegal.

It said that the validating act passed by the legislature is unconstitutional because it violates the due process clause of the Constitution, is not a uniform tax, and attempts to surrender police power of the state.

Reject New Rate Schedule, Grant Some Raises in N.C.

A proposed new rate schedule by the Old Fort Telephone Co. was turned down by the North Carolina Utilities Commission on June 15 on grounds that the company had "improperly computed the charges," but at the same time, the commission granted rate increases it considered "just and reasonable" (TELEPHONY, Mar. 19).

The company's proposed new rate schedule would have brought in an additional $9,181.10 a year, and Commissioner Robert Long said the schedule computed and approved by the commission was, in effect, about the same.

In asking for the rate increases, the company said it was operating at a loss.

Mr. Long said the commission found the financial structure of the corporation to be "improperly constructed," and the commission ordered the company to submit within 90 days a proposal for the reformation of its capital structure.

Approve New Rate Schedule For Company in South Dakota

The South Dakota Public Utilities Commission on June 1 approved a rate increase effective July 1, for the Black Hills Telephone Co., Custer.

New rates include $4.75 for one-party residence; $4.00 for multi-party rural residence; and $7.75 for one-party business.

Higher rates were also approved for dial service upon cut-over.

Authorize Stock Issue For Wisconsin Independent

The Wisconsin Public Service Commission on June 7 authorized the Midway Telephone Co., Medford, to issue $240,000 par value of common stock.

Of this amount, it is reported, $40,000 will be a dividend to stockholders. Proceeds from the sale of the remaining $200,000 will be used by the Midway company for financing construction and to pay short-term notes.

Report Sale in Kansas

The sale of the Vermillion (Kan.) Telephone Co. to the Blue Valley (Kan.) Telephone Co. has been reported.

Baltimore Council Enacts 1st Annoying Caller Law in Md.

Baltimore's City Council has unanimously adopted the first measure enacted in Maryland to penalize the making of annoying telephone calls.

The measure makes it a crime punishable by a $500 fine or a year in prison, or both, to use a telephone anonymously to harass subscribers or to make obscene suggestions.

Dropped from the ordinance was a section which would have penalized those who make "repeated" telephone calls with intent to torment or harass listeners. Members of the council's judiciary committee said these violators were covered under two other sections of the law.

The measure specifically makes anonymous calls a crime if they are "in a manner which may annoy, abuse, torment, harass or embarrass one or more persons."

Hear Two Rate Requests From Oklahoma Companies

The Oklahoma Corporation Commission, it was reported on June 9, has received applications for rate increases from the Salina-Spavinaw Telephone Co., Inc., Salina, and from the Gracemont Telephone Co.

The Salina-Spavinaw company asked that it be permitted to raise business rates from $5.25 to $7.50; and one-party residence rates from $3.75 to $5.50.

The Gracemont company asked to increase its business rates from $3.00 to $5.50; and residence rates from $1.50 to $4.00.

Appell Is Chief Engineer SW Bell in Oklahoma

W. M. Appell has been promoted to chief engineer in Oklahoma for Southwestern Bell Telephone Co. He succeeds Harvey J. McMains who has accepted a position as adminstrator-Data-Phone service in the marketing department of the American Telephone & Telegraph Co. in New York City.

J. B. Kibler Jr., equipment engineer in St. Louis, replaced Mr. Appell as building and equipment engineer at Houston, Tex.

Tremayne Resigns; Danielson President Illinois Company

S. F. Tremayne of Sycamore, Ill. resigned as president of DeKalb-Ogle Telephone Co. on May 31.

Mr. Tremayne went to the DeKalb-Ogle Co. from the Illinois Bell Telephone Co. in February 1958. He is accepting a position as attorney with the American Telephone & Telegraph Co. in its Washington, D. C. offices.

The directors of the DeKalb-Ogle Co. elected Clifford Danielson, president of National Bank & Trust Co. of Sycamore, to serve as president of the DeKalb-Ogle Telephone Co. for the unexpired term of the office. Mr. Danielson has been vice president and director of the company.

Daniel A. Schaefer, general manager, was elected to the position of vice president. Mr. Schaefer will be the principal full-time executive officer of the company.

Milwaukee Box Seat Fans Have Telephone Service

Holders of mezzanine box seat tickets at County Stadium, Milwaukee, can now mix business with pleasure at the ball park, it is reported.

The Wisconsin Telephone Co. has completed installation of facilities to provide regular telephone service for each of the 100 boxes in the mezzanine section. The cost is the same as that for regular single-party business telephone service.

Each box can be fitted with an outdoor type jack into which a telephone can be plugged. Cut-off keys on a control board in a room behind the press box can open or close the circuits.

A spokesman for the telephone company said that the service is not available in the lower box seat section because installation of the necessary facilities is not feasible there.

Obituary

HARLEY B. MCELYEA, 74, retired general inspector for Automatic Electric Co., died in Oak Park, Ill., on June 13 after being critically injured by an automobile on June 11.

Mr. McElyea began his career with the Northlake, Ill. company as an installer in 1909, following graduation from Iowa State College.

He was named an engineer in 1918 and helped form the first C-A-X (Community Automatic Exchange) design engineering group at AE. He also served as supervisor of engineering inspection, superintendent of design engineering, and director of product planning.

During the early 1900s, Mr. McElyea held supervisory positions with Alberta Government Telephones at Lethbridge, Alberta, Canada, and with Dakota Central Telephone Co., Carrington, N. D.

Survivors include his wife, Ethel, of Oak Park, and a son, Wesley of Muskegon, Mich.

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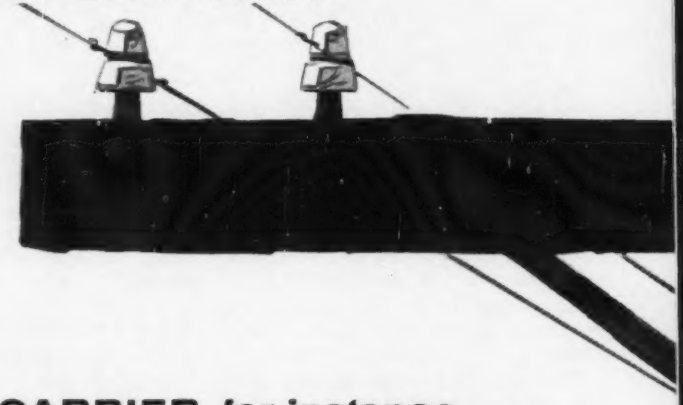

LENKURT SHORT-HAUL CARRIER, for instance . . .

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Types 45CA, CB, CC and CD provide four 4-channel allocations in the frequency range of 2 kc. to 156 kc., with all the advantages of Type 45 equipment for large circuit groups. In addition, the Type 45C terminals provide direct interconnection at carrier frequencies with all other 45-class systems for open-wire, cable or radio, and coordinate with W. E. Type O carrier.

Type 45C systems are transistorized, require a minimum of space, and employ interchangeable plug-in channel units. And each channel has its own compandor and regulator.

The AE-Lenkurt team of *telephone* engineers will handle as much of the planning and installation as you wish. And AE will provide "follow-thru" service *for the life of the equipment.*

For full information on the Lenkurt Type 45C systems or companion equipment, call your Automatic Electric representative, or fill in and mail coupon today.

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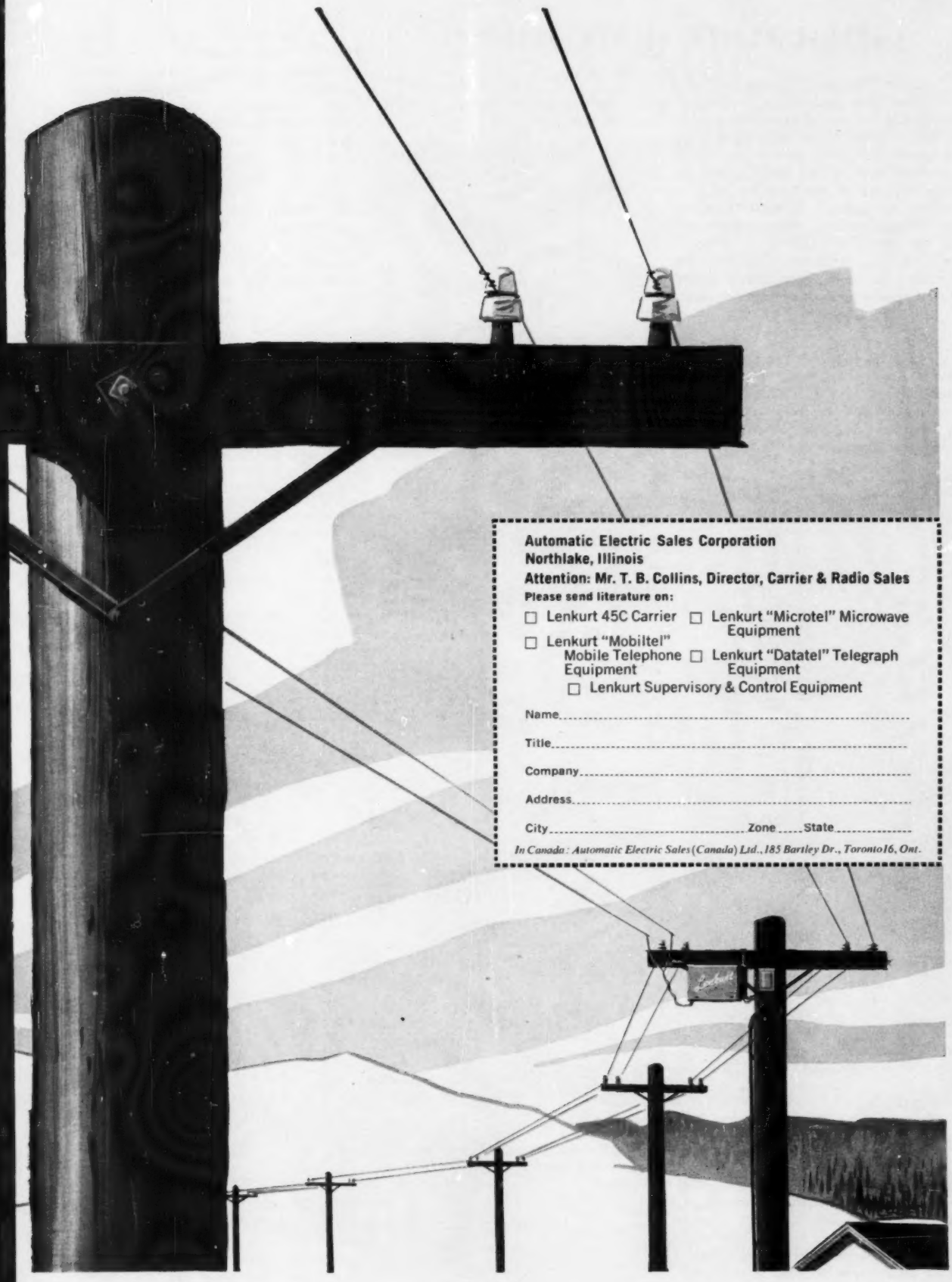

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ANNUAL REVIEW OF NEW PRODUCTS

Continued from page 26

telephone. It is produced in two models. The Model 641 can be connected quickly to any standard telephone making it an automatic one. The Model 600 comes complete with a six-button 500-type telephone, which has been modified to include microphone, ON-OFF switches and volume control. Features claimed for the Autotel are that it has no feedback and has extremely effective voice transmission, making it ideally suited for conferences and long distance calls.

•

Electro-List Camera (Fig. 39). The Hayes Electro-List Camera was developed to meet the demand for high-speed and inexpensive reproduction of data by the sequence photographing of data previously compiled on IBM type cards.

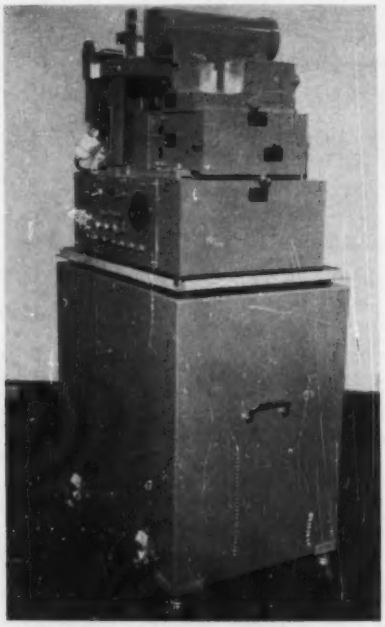

Fig. 39. Electro-List camera.

Inasmuch as the Hayes company has a large technical publications organization, it is prepared to sell its services for the preparation of negatives or plates to customers who may not have sufficient requirements to lease or buy the Electro-List Camera.

•

The Portalite (Fig. 40). There are two models of the Hayes Portalite, one using external power sources, the other using its own self-contained power source. This unit will be especially valuable to telephone companies for illumination on a rush job, requiring night work or emergency repairs following natural disasters.

Fig. 40. The Portalite.

Battery Chargers (Fig. 41). A new line of Rectichargers, automatically-regulated, constant voltage battery chargers for the telephone industry has been developed by the Raytheon Co. One model is 50-volt, 9-amp.; another is 50-volt, 18-amp., and a third is a 66-cell, 3, 6 and 12-amp. The output voltage of these rectifiers is precisely regulated to within plus or minus 1 per cent from no load to full load and for line changes of plus or minus 10 per cent. This degree of voltage stability is made possible by an exclusive magnetic amplifier control circuit which prevents battery gassing and water loss caused by overhanging and undercharging.

The following additional significant advantages are claimed for this line of rectifiers:

(1) Considerable reduction in size and weight save approximately 50 per cent in rack space.

(2) Increased reliability through the use of conservatively rated silicon power rectifiers. Rectifier aging is eliminated.

(3) Dependable, stable voltage reference without complicated transistor circuitry.

•

Data Transmission Terminal (Fig. 42). The Model 1726 High Speed Data

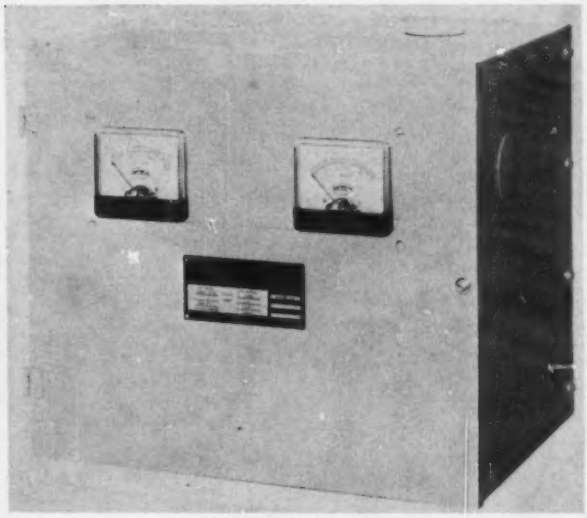

Fig. 41. Telephone type battery charger.

Fig. 42. Data transmission terminal.

"Now, I can bill a dozen toll-call tickets in less than a minute!"

"Taking pictures with our new RECORDAK Portable Microfilmer helps me get bills out 4 times faster than before"

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Transmission Terminal, by Radio Frequency Labs, Inc., is a frequency shift terminal designed for the transmission of data at speeds up to 7,000 bits per second and it may be directly applied to microwave equipment or open wire telephone circuits. Twenty-one standard channels, providing a bit rate of 2,400 bits per second, are available for 20 to 110 kc. Five 7,000 bits per second channels are available from 50 to 110 kc. The transmitter input and the receiver output are arranged to be compatible with most currently available high-speed data equipment. Transmitters may be keyed from dry contacts or voltage pulses and the receivers provide voltage of current output pulses.

Equipment is available packaged as a single transmitter, dual transmitter and single receiver and will mount on a standard relay rack. Dimensions: 3½ inches x 19 inches.

•

Portable Microfilmer (Fig. 43). This new Recordak portable microfilmer is now available and may be used to advantage by both large and small operating companies. It is reported that

Fig. 43. Portable microfilmer.

this machine is the only portable on the market on which two rolls of film may be exposed at the same time. One of these can be used for security purposes. In addition, it is claimed to be the only microfilmer on the market with a 100-foot film capacity. In addition, the documents fed through the microfilmer are returned in the receiving hopper in their original sequence.

This unit weighs 24 pounds. It measures 6½ inches x 15½ inches x 12½ inches. It fits conveniently into a handy accessory carrying case.

•

Hygrometer Reading Device (Fig. 44). In announcing this device the manufacturer, C & D Batteries, Inc., states that the specific gravity of a battery drops during discharge. Then, upon recharge, sufficient time and agitation of the electrolyte, by gassing, is necessary to thoroughly mix the acid, or electrolyte, so that a true specific gravity reading may be obtained when the sampling is made at the surface of the electrolyte. In new lead antimony batteries, and in all lead calcium batteries, there isn't a great deal of gassing evolved when charging at normal float values, or even when placed on equalizing charge. Considerable time must, therefore, elapse before true readings can be obtained by the conventional method of sampling the electrolyte in the surface. This same thing is true when cells are watered, since it takes considerable time for the water to mix with the electrolyte, which has a much heavier specific gravity or density than water.

Fig. 44. Hydrometer reading device.

In this new cell design, a plastic tube has been provided which extends down through the cover approximately one-third from the top of the plates. This tube is used for sampling the electrolyte. Obtaining a hydrometer reading from this portion of the cell gives an average reading that is a true indication of the state of charge. The specific gravity reading taken at this point does not require the time lag necessary when a reading is taken at the top of the cell as mixing is not necessary, C & D states.

These tubes are located in diametrically offset corners of each cell so that readings can always be taken nearest the aisle. This arrangement avoids the necessity of reaching over the top of a cell to take readings. These tubes are now regular equipment in a new series of plastic-cased storage batteries of the larger sizes.

•

Impedance Matching and Dial Set (Fig. 45). This network provides impedance matching between 600-ohm and 900-ohm circuits and, in particular, between 600-ohm oscillators and transmission level measuring sets and a 900-ohm line, according to the manufacturer, Northeast Electronics Corp.

In addition, it provides switching circuits to calibrate the oscillator and transmission level measuring set, to send or receive on 600-ohm circuits and to send or receive on 900-ohm circuits.

On the LINE circuit (twin jack marked MEAS.) it provides switching facilities which:

(1) Extend the LINE to an MF jack.
(2) Insert a dial in the LINE circuit.
(3) Extend the LINE circuit to the measuring jacks and insert a HOLD coil across the LINE circuit.
(4) Terminate the LINE in 900 ohms, OPEN circuit, or SHORT circuit.

The set provides a TRUNK jack and

Fig. 45. Impedance matching and dial set.

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a monitor circuit in parallel with the LINE circuit and contains a pin jack which gives access to the LINE sleeve.

•

Impedance Matching Network (Fig. 46). Northeast Electronic's Model TN-1 impedance matching network is used to ensure negligible terminal reflection

Fig. 46. Impedance matching network.

effects due to mismatches between the 600-ohm test equipment and cable pair impedance at both ends of the line, where transmission loss measurements are made on loaded exchange type cables. Matched terminations of this nature permit an accurate comparison between the computed and measured transmission losses of a loaded cable pair and provide a basis for detecting the presence of impedance irregularities.

Three sections are included in the Model TN-1.

(1) Cable Build-Out Capacitor. Used to build out the cable end-section to 0.8 of a full loading section, in order to obtain a resistance component of the cable impedance, which is essentially constant over the frequency range.

(2) Inductor. Used to approximately cancel out the capacitive reactance of the cable impedance when built out to 0.8 section by the cable build-out capacitor.

(3) Equipment Build-Out Resistor. The build-out resistor is used to match the modified resistance of the cable pair to the 600-ohm test equipment by increasing the resistance of the equipment to a value equal to the modified input resistance of the cable pair.

Twin telephone jacks are included at the input and output of the network; insulated binding posts are also supplied.

•

Dielectric Test Set (Fig. 47). This test set, by James G. Biddle Co., consists of a dc power supply using selenium rectifiers, variable auto-transformers for output voltage control, meters for measuring output current and voltage, operational controls, and protective devices. The rectifier associated circuits and components are mounted on a metal panel. On top of the panel are located a microammeter, kilovoltmeter, range selector switches for each meter, control knob for the variable voltage auto-transformer, input and output breakers, and a neon indicating lamp. Power supply, ground connection and output cable with connectors are permanently attached.

With this test set the leakage current, through insulation and over its surfaces, may be measured individually where guard connections can be made to the guard circuit of the test set. Also, leakage currents between two of several separately-insulated conductors may be measured individually by connecting the other conductors to the guard circuit of the test set.

Fig. 47. Dielectric test set.

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Remote Control Supervisory and Telemetering Equipment (Fig. 48). This remote control supervisory and telemetering equipment, manufactured by Moore Associates, Inc., is a compact,

(Continued on page 49)

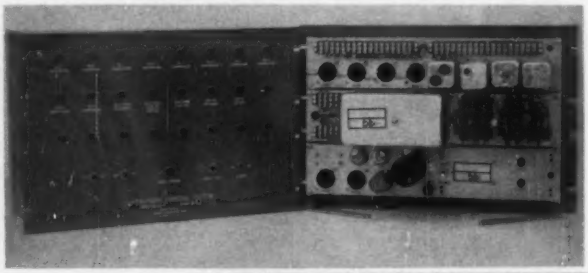


Fig. 48. Remote control supervisory and telemetering equipment.

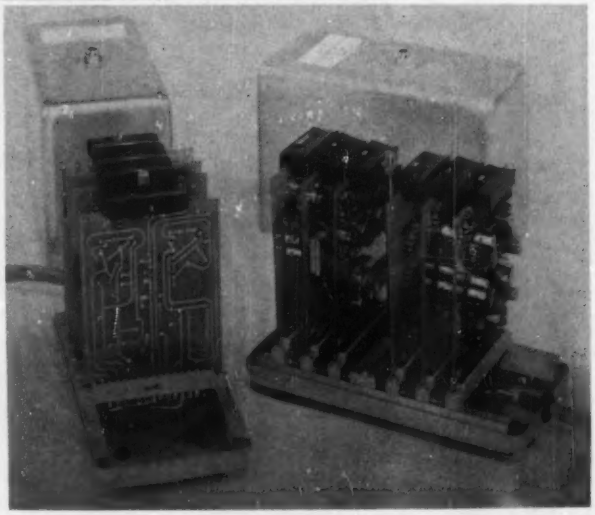


Fig. 49. The coder and decoder.

You, too, could build a telephone!

How efficient is the assembly process detail? Ed Wallin tries it out, checked by George Scheck.

"What's so hard about producing a new telephone?" This question—perfectly normal for those who have never tried it—had been heard so often at 100 Carlson Road that it seemed to invite a little probing. It was revealing!

Behind the product is a philosophy. Stromberg-Carlson sells its products on a free-choice basis. Therefore, the most important consideration is acceptance . . . will the Independent telephone company find it easy and profitable to place such an instrument with its subscribers? The design concept should meet the criteria of demand, as far as this can be determined.

A number of years ago, as a normal, continuing product study, the possibilities of a lighter, smaller telephone instrument were explored. Like the Independent operating companies and the Bell System, we needed to know if a new size and shape, and added services, would be acceptable to the public. Would this stimulate *additional* business; what rates would be applicable? No one person or group had the answer, so the Marketing Research group, supplemented by our Field Representatives, was directed to find the facts and make recommendations from this knowledge. Throughout this program and study we have enjoyed the wholehearted cooperation of the Bell System marketing personnel, engineering and manufacturing units.

We guessed wrong

Original guesses were often proved wrong by the data collected. For instance, the first assumption had been that the market for a smaller, lightweight instrument would be for extensions only. Our Independent polls corroborated the surprising experience in Bell System test market areas with a similar type phone—that a significant number of installations of such a compact telephone would be to provide main station service.

It was thought, in this age of color, that some of the more brilliant hues would predominate in preference ratings; yet the present acceptance of subscribers puts white in first place, closely followed by beige. We know that these "neutral" colors will make the telephone company's inventory problem simpler, and were glad to find how cooperative the consumer is!

A name — descriptive, simple and appealing — has become an important merchandising tool for the telephone company in promoting subscriber products. The new Stromberg-Carlson instrument must certainly have a name! To get the proper Independent market coverage, a national research group questioned a large and scientifically selected panel; the final result was an overwhelming vote of confidence for one name — PETITE — as most descriptive, easy to remember, having pleasant associations.

How new is the PETITE?

Next, the Marketing Research group tabulated the results of its findings: size of the market, color preference, where in the house the phone would be used, most-wanted features, and many more. This study became very important as the basis for decisions on design and tooling—what will be new, what adapted, how produced?

One of the early decisions was to use the present lightweight, high-efficiency Stromberg-Carlson handset, for it was considered essential to retain the proven high-quality transmission of the 500-type instruments; nothing less would be acceptable. The decision on the handset determined the contour of the housing, since the design concept nests the handset directly on the instrument base. The design was beginning to take shape from the top down; now how petite could the PETITE body be?

There was no question about the network; it had to be repackaged as a more compact unit, while retaining the *identical* components and electrical characteristics of the 1543-W telephone. This unit was compressed to fit the anticipated contour of the housing and thoroughly tested.

Then, before anything further could be frozen, the necessary space for a hookswitch mechanism had to be determined. After considerable design effort and rigorous testing, this component was finalized; drawings for the housing mold were then released.

Dial glows — lights

Subscribers had already made one decision . . . . since one of the most frequently mentioned places of installation was the bedroom, the dial must be illuminated. In addition, it should glow softly in the dark so that it could be found quickly, surely—the assurance that your telephone is within reach at the moment you need it.

A dependable lamp, easily replaceable by the subscriber when necessary; a slide-switch to extinguish the glow if desired; prismatic reflection from the clear plastic finger wheel to give maximum illumination on the dial—these were "musts." Could this be achieved with present components?

Market researchers Cheney, Phelan and Confeld check latest subscriber preference returns against earlier tabulated results.

ADVERTISEMENT

Engineers Prace, Petrangelo, Collier and Cadwallader fit experience-proven components in new, compact housing.

The designer lives with compromise; this part of the design became a modification project because of space limitations. As in many other instances, the attempt to escape a dilemma led to an entirely new approach—in this case, the dial mounting. No previous design offered the firm, rigid support so necessary for easy operation and trouble-free service.

Reach, but don't fall

The basic design frozen, a handmade model was put through its paces. It could have been perfect—but it wasn't. Normal stretching of the retractable cord tended to pull the light phone off the table or stand; also the action of dialing made it skid. A double insurance against this problem was taken; a "soft-pull" cord that stretches with less tension, and additional gripping power in the wafflelike structure of the rubber pad covering the entire base of the phone. There followed considerable jockeying with the supplier of the pad to be sure that specifications could be met, and how this seemingly unassuming part could be produced. Just the little item of proper adhesive for attaching this pad fills a page in the engineer's notebook. It can now be said with confidence that normal operation will be a pleasure for subscribers . . . no slip, no slide.

Then there's the unforeseen

Because the handset nests directly on the housing, it seemed desirable to mold both units from a harder type of thermoplastic, now available. This plastic is more resistant to scratches and at the same time less subject to stains or fading.

However, the compound proved to have different shrinkage characteristics in the injection presses; many a bad hour haunted the tool engineers before parts from the presses could be brought within the acceptable tolerances. Now they sleep better!

Another interesting sidelight—this time planned — was "Project Peek-thru." The first half-dozen housings from the molding dies were made from transparent plastic so that engineers could look inside the assembled PETITE telephone to detect visually any clearance problems. One such trouble spot was corrected by relocating a pin in a punching die; another by correcting a machined radius. It was also possible to see and study the action of the hookswitch under conditions of actual operation. A "glass house" just can't keep a secret!

Let's build some

Even while the design was being finalized, and tools procured or altered, three other groups were deep in a parallel operation: production engineering—deciding how it will be built and inspected; production control — scheduling machine time and assembly space, also planning inventory control; purchasing — providing high-quality components at the right time in the right quantity.

Theoretical process details (the order of assembly operations and "how-to" instructions) were written and followed to the letter. Experience then showed whether they should be approved or revised. Every component —purchased or made—was tested vigorously; each subassembly was then subjected to harsher than normal treatment to see if any weaknesses could be spotted for corrective action. Finally, there was a telephone. Obviously, this had to perform or be modified. Only after final acceptance could tooling be frozen, jigs and assembly fixtures made.

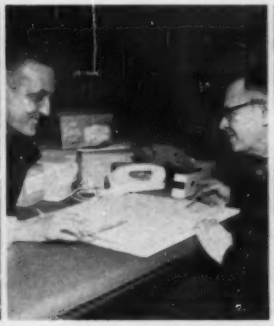
At the same time a chess game, which often appears closer to Russian roulette, is going on in the production control and purchasing departments. Following the "make-or-buy" decisions of production engineering, a huge task of scheduling remains. Suppliers must be found for purchased components who can meet quality specifications *and delivery*. Internal shop load must be adjusted to accommodate the new manufactured parts. The ever-present question that must be answered: what lead time is necessary in order to have the *last* part ready when the phone is put on the production line?

And just when the final piece is fitted in the picture, will a supplier's problem or a transportation breakdown tip the table and drop all the pieces in your lap? The job of production control and purchasing is to see that this doesn't happen.

It won't be long

The steps we have been talking about are just a few of the details now behind us. As this is written, the expanded instrument assembly line at Stromberg-Carlson is again proving its flexibility. New eye-catching cartons are now being filled with this exciting instrument your subscribers have asked for.

There is no good reason why you couldn't build this telephone for them yourself . . . . but you might find it easier to order PETITE telephones from Stromberg-Carlson.



How to build it: production engineers Bonnet, Swanson and Kessler. Scheduling and purchasing: Ballou, Dornbrock, Parkes, Nellis, Wink. What kind of package? Haupt and Hail. Production starts: Helen Giofrida at first station on assembly line.

versatile electronic system used to remotely control an operation which may be controlled by the opening or closing of a contact. The equipment may also be used to remotely indicate any condition existing that manifests itself by the closing or opening of a contact. In conjunction with appropriate gating circuits, analogue and digital telemetering signals can be transmitted.

To explain the operation of the basic eight function system, assume that it is in use as a monitor for eight different operations at a remote location. As long as conditions at the remote locations are normal, all indication lamps or alarms at the base station will remain unlit or de-energized. As soon as a switch closure occurs at the remote location, a light will light or a suitable alarm will sound at the base station to alert the operator. These conditions will persist until the trouble has been cleared. The maximum delay between the time that the malfunction occurs and a visible or audible alarm will be less than one-half second when a 15-cycle clock rate is used. Each function is scanned at the remote location at least twice every second.

If the equipment is being used as a remote control device, the base station operator will have eight switches at his disposal to turn on or off any of the eight controlled operations at the remote location. The maximum delay between operation of the switch at the base station and the actual closure of the relay at the remote location is less than one-half second when a 15-cycle clock rate is used.

Thus, it will be seen that with the installation of a two-way system, it is possible for the operator to remotely control an operation and to get a return signal showing that the operation has actually taken place and also to have continual monitoring of the operation.

Remote and base stations can be connected either directly by wire lines, or by utilizing carrier equipment, VHF, or microwave equipment. Allowable distance betwen the remote locations and the base station are determined by the electrical characteristics of the connecting line. There is no limitation on distance if carrier equipment or repeaters are used.

A coder and decoder, shown in *Fig. 49*, are available to customers who wish to use their own mounting arrangements, or to experiment in their application at minimum expense.

(To Be Continued)

Mark of Immaturity

"To be ignorant of the lives of the most celebrated men of antiquity is to continue in a state of childhood all our days."—PLUTARCH.

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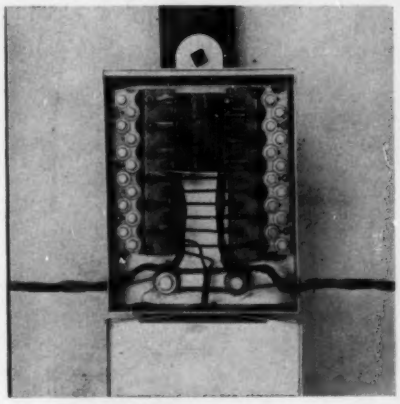

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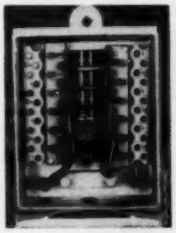
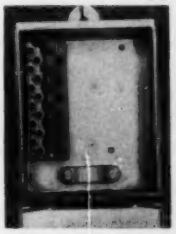
Types 177A-177B



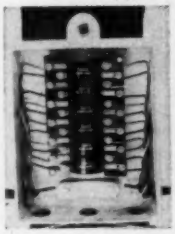
Contains two protected terminal strips complete with type 637A(88MH) or 637 B (44MH) coils.

Type 177F



Contains one protected terminal strip —no coils.

Types 177C-177D

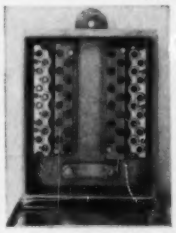


Contains two non protected strips complete with type 637A(88MD) or 637B(44MH) coils.

Type 177G

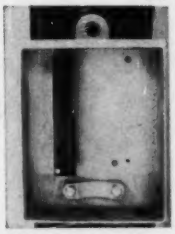
Contains two non protected strips — no coils.

Types 177E



Contains two protected terminal strips—no coils.

Type 177H



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THARP TO SUCCEED HARDY

Concluded from page 36

cessor of the Illinois Southern Telephone Co. in April, 1931, with headquarters at Springfield, Ill. He served in that capacity up to the time of his election as secretary of the Illinois Telephone Association on Aug. 1, 1944.

Mr. Tharp, at the time of his election as secretary, was manager of the labor relations department of the Illinois

J. F. THARP

State Chamber of Commerce. He was appointed to that position on Apr. 1, 1957. In that capacity, he has worked with the Chamber's labor relations committee on a wide variety of problems in the labor-management field. The committee concerns itself with labor-management relations problems, including national and state legislative issues.

Mr. Tharp, who is 35, joined the Illinois State Chamber of Commerce from Montgomery Ward in Chicago, where he was a labor relations attorney, specializing in union negotiations. His work with the mail order house necessitated a heavy travel schedule and a continuous series of labor negotiations. Other responsibilities there included the handling of National Labor Relations Board elections, as well as other matters pertaining to labor relations and labor law. Mr. Tharp also served for four years (1951-1955) as a special agent of the Federal Bureau of Investigation in the investigative agency's Chicago and Los Angeles offices.

He was born in New Albany, Ind., graduated from high school at Palmyra, Ind., served in the U. S. Marine Corps from 1943 to 1946, and was graduated in 1951 from the Chase College of Law in Cincinnati with an LLB degree. After graduation, he successfully completed the Ohio Bar examination and was admitted to the bar of that state in March, 1951.

IN THE NATION'S CAPITAL

Continued from page 18

until, in the words of Senator Magnuson (D., Wash.), chairman of the committee, "We will know more about who will be President next year."

One other action in Congress seems likely to affect the federal regulatory agencies, if it can be pressed to its ultimate conclusion. The House Interstate and Foreign Commerce Committee approved a so-called "hold-over commissioner" bill. This bill (S. 1965) has already been approved by the Senate. It would allow members of all six federal regulatory agencies whose terms expire to continue in office until their successors are appointed and confirmed by the Senate.

Under present law this is the case for members of the Civil Aeronautics Board, Federal Trade Commission, and Interstate Commerce Commission. There is no such law for the Federal Power Commission, Federal Communications Commission, and Securities and Exchange Commission. The bill approved would allow members of the last three agencies to continue to serve until their successors are appointed and qualified, but not beyond the end of the congressional session which follows the expiration of their terms.

Assuming that FCC Commissioner Lee is confirmed, there is still a vacancy on the FCC left by the resignation of former Chairman John C. Doerfer. Readers will recall that President Eisenhower at first named the New Jersey attorney, Edward K. Mills Jr., to this post only to have the nomination founder on a conflict of interest technicality.

The latest word going around Washington on this vacancy is that it has been offered to the dean of the Detroit College of Law, Charles H. King. Although a native of Gulfport, Miss., Dean King has long been active in Republican politics, and was the Michigan manager for the presidential campaign of the late Sen. Robert A. Taft of Ohio in 1952. King, now age 54, has been on the faculty of the Detroit College of Law for 23 years, and dean for 16 years. If Eisenhower appoints him to the vacancy on the FCC, it would be only for a single year of former Chairman Doerfer's unexpired term, during which time King would take a leave of absence from his law faculty position in Detroit. He could be reappointed, of course, but that would be up to the next President.

Some opposition is being heard over the bill in Congress to outlaw deceptive broadcast practices. This bill has now been cleared for floor action in the

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(ATTACH TO YOUR LETTERHEAD)

House. Fear has been expressed that the rigid statutory standards would virtually require the FCC to exercise powers of censorship.

The pending House bill is the result of "payola" and rigged TV show disclosures brought to light by the House Interstate and Foreign Commerce Subcommittee on Legislative Oversight. The House proposal has been added to a minor bill already passed by the Senate (S. 1898), dealing with broadcasting licensing procedures. Radio and TV station employes would be required to report in advance any promises made to broadcast anything in exchange for money or gifts. The station would then be required to announce that the broadcast matter had been paid for, unless the FCC waived the rule on the grounds of "public interest, convenience, or necessity."

The legislation also outlaws rigged quiz shows with penalties up to $10,000 and one year in jail for violations. The bill, for the most part, follows the general recommendations of the sub-committee. The full committee did delete one section urged by the sub-committee, which would have required the FCC to regulate and license radio and TV networks, just as individual stations are licensed. Should the House approve the bill, which seems likely, the Senate will probably accept the House provisions so as to avoid a conference to make the bill acceptable to both chambers.

Amending the Senate-passed licensing bill will avoid the necessity of routing a House proposal through a Senate committee, which could be time-consuming. With Congress pressed for a July adjournment, the shortest way will probably be followed. Indications are that the White House will approve.

Financing of Utilities

Utility companies should sell securities more often and in smaller amounts. This was the gist of a speech delivered by Harold H. Young, before the Edison Electric Institute's 28th annual convention in Atlantic City, earlier this month. Young, who is a limited partner of Eastman Dillon, Union Securities & Co., criticized the utility industry for its refusal to change from established patterns in offering bonds "just because you have always offered bonds with certain provisions." He said pension funds at the moment are the "big buyers" of utility company bonds and added, "It is a break for the utility companies that these funds have come into the market in a big way as some traditional buyers have become much less avid."

He said pension funds, mutual funds, and private investors are presently the "best buyers" of utility common stocks, and added that there are "definite indications that some investors, shying away from overpriced industrials, are turning to sound value utility stocks."

Mr. Young said market results have not been encouraging for companies that have added a stock dividend to their cash dividend to minimize or avoid common stock financing. Stocks of companies pioneering this idea, he said, "have not responded marketwise in a way that suggests a spontaneous reception of the idea."

Rules on TV Property Right

A Montana district court judge has ruled that a television station has no property rights in the programs it broadcasts. This is believed to be the first ruling on this issue and may have nation-wide implications for the television industry. The case involved a community antenna television system, Helena Television, Inc., which was defendant in a suit brought by Z-Bar Net and Television Montana. They operate the TV stations in Butte and Helena. They sought to stop Helena TV from picking up the signal of a TV station and distributing it by means of telephone cable to its subscribers in Helena.

The plaintiffs maintained that, since some of their programs were involved, Helena TV could not use them without their permission. The court's ruling said the plaintiffs "have no property interest by copyright or otherwise, in any programs broadcast by station KXLF-TV, or in any signals or programs received on the defendant's community antenna system and distributed to the defendant's subscribers by means thereof." Activities of Helena TV, the judge said, of picking up signals of the TV station and rebroadcasting them do not constitute "an infringement upon or a violation of any rights or privileges of either of the plaintiffs in this action." The decision will doubtless be appealed to a higher court.

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Telephone Used to Attract Teens by Louisiana Retailer

A "teen telephone service" has been placed in use by the C. H. Holmes Co. department store, of New Orleans, La.

Used to attract teen customers to the store, a free telephone has been placed in the retailer's shoe department. Here, teeners don't have to bother with coins for making calls, or ask parents for permission.

In steady use, the telephone, according to Henry Rogers, buyer for Holmes, has brought in as many as 60 teenage girls in a day.

COMPETITION HERE

Concluded from page 22

moving into these areas to work for these companies will likewise expect the most modern service. We can profitably participate in this competitive market.

Bell Companies Active

We Independents might well take a page out of the book of the Bell System which is losing no time in alerting its employes to the dangers of today's competitive market in the communications field.

In a warning currently addressed to the Bell associated companies, Stanley F. Damkroger, sales dynamo in AT&T's Marketing department, says:

"The manner in which we respond to its (competition) stimulus is a matter of far-reaching importance in terms of the future growth and welfare of the business. . . . We have always been in competition for our share of the customers' dollar. However, we have not in the past faced real, hard-hitting direct competition as we face today and will face with increasing intensity in the future. . . . We are in a contest with people to whom the rough and tumble of competition is the very breath of business life."

Mr. Damkroger sees an ever-expanding market for communications services tailored to specific needs and desires of both householders and business enterprises.

"These needs," he declares, "must and will be satisfied. And, if we telephone people don't meet this demand of the market place, someone else will. If we are to get our share of the customers' dollar in these areas, everyone must develop the same spirit that people in companies that sell washing machines, automobiles, and other competitive products have."

There is no reason to doubt the wisdom of these remarks nor of Mr. Damkroger's summation of the problem:

"The challenge of competition is real and dynamic but with all of our resources to back us, with our service offerings geared to the market—priced right, easy to buy, readily available, and soundly aggressively sold—we can and will meet the challenge and have fun doing it."

Industry Will Move

There is an important factor that encourages me to feel that we will not complacently sit by and let some one else provide the "champagne flights." Ours is an industry guided by thousands of aggressive managers who are aided by everyone from the office clerk to the grunt lineman. Such management prevents major errors. Mistakes are more quickly recognized and corrected.

We of the telephone industry are alert. We have the customers and we have the ability to provide any communication service in a more satisfying way and at a more favorable price than anyone else.

Let us not hide our light under a bushel. Let us tell our customers that we have what they want in communication service, and, before it is too late, we should give thought to taking down that sign that says "Telephone Company" and consider a bright new sign that says "Communication Center."

Ky. Independent Sets Up State-Wide Organization

Northeastern Telephone Corp., London, Ky., and affiliate companies in Kentucky recently shuffled executive personnel into a state-wide organization unit.

W. W. Thomason, manager of the Calvert City (Ky.) System Inc., was named general manager of the Kentucky companies, which also includes the northern division of Northeastern at Brooksville and the Mammoth Cave Telephone Co., Park City.

Oscar Bruner, southern division manager of Northeastern at London, will continue in that position, as will H. S. Poage in the northern division.

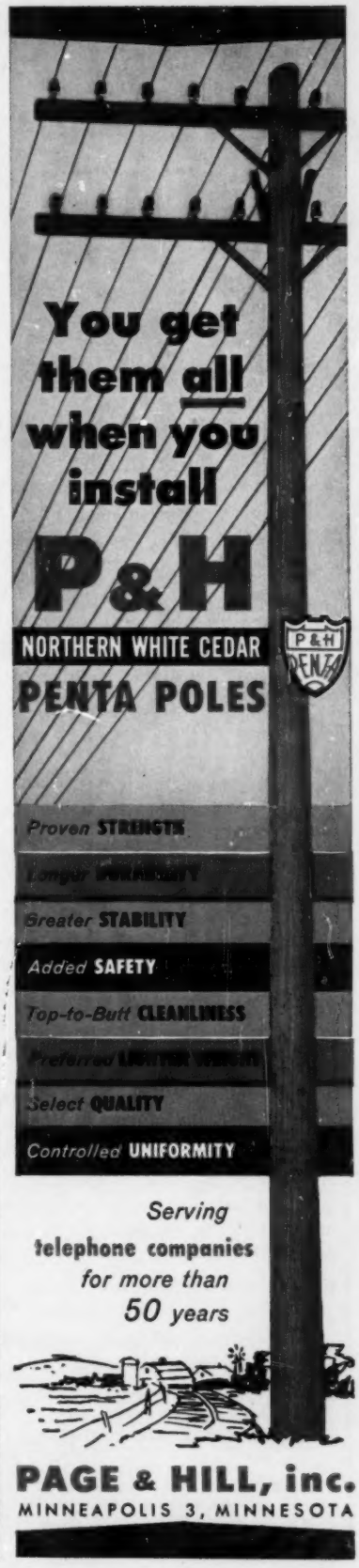
Also in the state organization is Frank Shufflebarger, chief accountant for the companies; J. Paul Lackey, plant superintendent, and Ray McClure, commercial manager and director of public relations.

Dennis Armstrong, manager at Mammoth Cave, will become manager of Calvert City. Rex Cullop, central office supervisor at Calvert City, will become manager at Mammoth Cave.

Mr. Thomason has been manager at Calvert City since June 1954. Prior to that time he owned the Smithland Telephone Co., now a part of the Calvert System.

Examples Teach Introspection

"So admirably hath God disposed of the ways of men, that even the sight of vice in others is like a warning arrow shot for us to take heed. We should correct our own faults by seeing how uncomely they appear in others; who will not abhor a choleric passion, and a saucy pride in himself, that sees how ridiculous and contemptible they render those who are infested with them?"—J. BEAUMONT.



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AE Names Hilton SE Field Installation Supervisor

R. C. Hilton, formerly senior installation foreman, has been appointed field supervisor for the installation and service department of Automatic Electric Sales, Northlake, Ill.

Mr. Hilton will have direct supervision of all installation activities for the southeastern district of AE Sales. This

R. C. HILTON

area comprises the states of Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

His headquarters will be in the district office at Atlanta, Ga. This new position was created to provide improved customer service and increased liaison between AE's home office at Northlake and the field personnel.

Mr. Hilton joined the subsidiary of General Telephone & Electronics in July, 1940 as a junior installer. He was promoted to senior installer in December, 1940. After attending the company's training school in 1941, he was named installation foreman.

His responsibilities included supervision of various civilian and military installations during World War II. He was named senior installation foreman for AE in 1945.

A native of Allentown, Ga., he attended Georgia Institute of Technology in Atlanta.

Stromberg Appoints Clark As an Iowa Representative

T. C. Thompson, general manager of commercial sales for Stromberg-Carlson's Telecommunication Division, has appointed Robert N. Clark as junior sales representative for Iowa.

Mr. Clark will team with J. E. Fairly, Iowa sales representative, to cover expanding Independent telephone operations in that state. He will report to W. J. Pfaender, Chicago Branch sales manager.

R. N. CLARK

During the past seven years Mr. Clark has gained experience at Stromberg-Carlson as a test engineer, as carrier engineer, and in the advertising department as a sales and technical writer.

He served in the New England states as a sales representative for two years. In 1957 he went to Rochester to augment the national sales engineering staff.

He has also served as an instructor at Stromberg-Carlson's XY Dial School.

A native of Rochester, N. Y., Mr. Clark was educated in electrical engineering at the University of Miami (Fla.) and at the University of Texas.

He saw military service with the Air Force as a research technician assigned to the School of Aviation Medicine and the Atomic Energy Commission.

Holan of Georgia Appoints Merle Call Sales Manager

Merle Call has been appointed sales manager of Holan Corp. of Griffin, Georgia, according to Robert R. Rector, vice president and general manager. The Holan company manufactures bodies and truck-mounted power equipment for use in the communications, electric power, and other industries.

Mr. Call joined Holan after more than 13 years of sales and sales management experience. He served as southern district manager for the Eagle-Picher Co.; as southern regional manager of the Kaylo Division, Owens-Illinois Glass Co.; and as New England

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district manager for the Baldwin-Hill Co.

Prior to his sales experience, he had three years of engineering and operating training.

MERLE CALL

A native of Clarion, Pa., Mr. Call studied industrial engineering at Penn State University prior to World War II and received his degree in mechanical engineering after the war at Villanova. He served as a Marine Corps officer in both World War II and in the Korean War.

He is a member of the American Society of Mechanical Engineers, the American Petroleum Institute and of The Thermal Insulation Society.

Sears Stromberg Western Manager; Succeeds Galligan

Edgar R. Sears Sr. has been advanced to the position of manager of the West Coast branch of Stromberg-Carlson's Telecommunication Division, according to an announcement on June 10 by T. C. Thompson, general manager of commercial sales of the division.

E. R. SEARS SR.

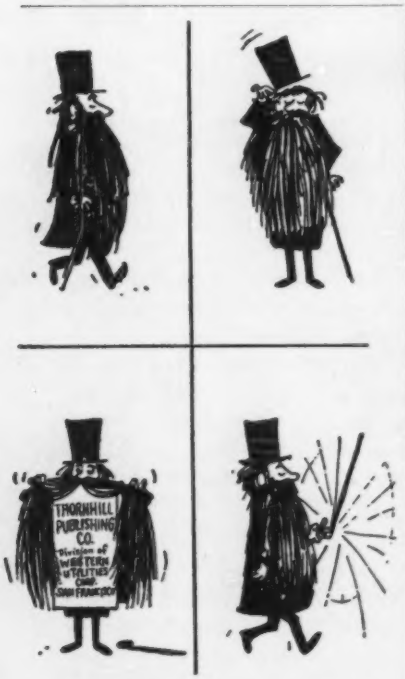
In this position Mr. Sears will succeed Joseph P. Galligan, who will continue to serve in the West Coast branch office as a sales consultant.

"The dynamic growth of this section of the country and the potential for further development make it imperative that a smooth transition in managerial responsibilities be effected prior to Mr. Galligan's retirement," Mr. Thompson said.

Mr. Sears, from 1941 to 1955, was Pacific Coast manager for the Kellogg Switchboard & Supply Co. Previously he had been a field sales engineer and manager of switchboard sales for the same firm.

His telephone career, covering more than 40 years, started with a job as repairman-installer for the Southwestern Bell Telephone Co. in Hutchinson, Kans.

In 1922, Mr. Sears accepted a position with the United Telephone Co. of Kansas as plant chief for the Hays and McPherson offices, and a few years later, he became equipment engineer at



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the Abilene headquarters of the United system.

He went to Stromberg-Carlson in 1955 to head the telecommunication division's industrial sales department, and has been in touch with West Coast operations through industrial sales activity in that area.

J. P. GALLIGAN

Mr. Galligan has completed 45 years of service with Stromberg-Carlson's Telecommunication Division, the last 15 as manager of the West Coast branch.

After first spending five years with the company's installation force, he moved into the sales department, traveling the Midwest for 25 years before his appointment as West Coast manager in 1945.

Mr. Galligan supervised the branch's move into the greatly enlarged Burlingame facility, from which the company serves 10 Western states, including Hawaii and Alaska.

General Cable Transferring Howard to Chicago Field

Charles E. Howard, associated with the General Cable Research Laboratories, will be transferred in July to the Chicago telephone sales office for field engineering work, the company announces.

Mr. Howard's experience in the telephone cable field began in 1937 when he first attended post graduate school courses at Johns Hopkins University given jointly by the school and the Bell Laboratories. The courses covered the field of outside plant engineering.

He was employed by both the Bell Laboratories and the Western Electric Co. until 1956, when he became associated with General Cable Corp.

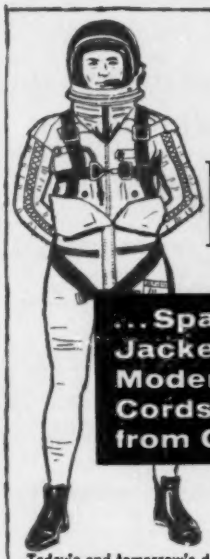
Working at the corporation's research laboratory in Bayonne, N. J.,

C. E. HOWARD

Mr. Howard contributed to and assisted in the design and development of long distance toll, coaxial and video pair cables. He has recently devoted most of his time to solving problems in the testing and installation of aluminum-sheathed telephone cables.

His transfer to Chicago will make Mr. Howard's services and experience available for field engineering work in conjunction with telephone cable matters. His responsibilities will include consultation with users of aluminum-sheathed telephone cables.

James G. Johnson, formerly assistant sales manager of Comptometer Corp.'s Business Machines Division, has been appointed general sales manager of Comptometer's Electrowriter system sales. Since 1946, he has risen through the posts of calculator sales representative to district sales manager, Cleveland; to Midwest regional sales manager, and assistant sales manager, prior to his new Electrowriter post.



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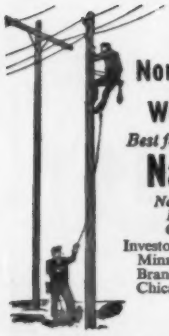

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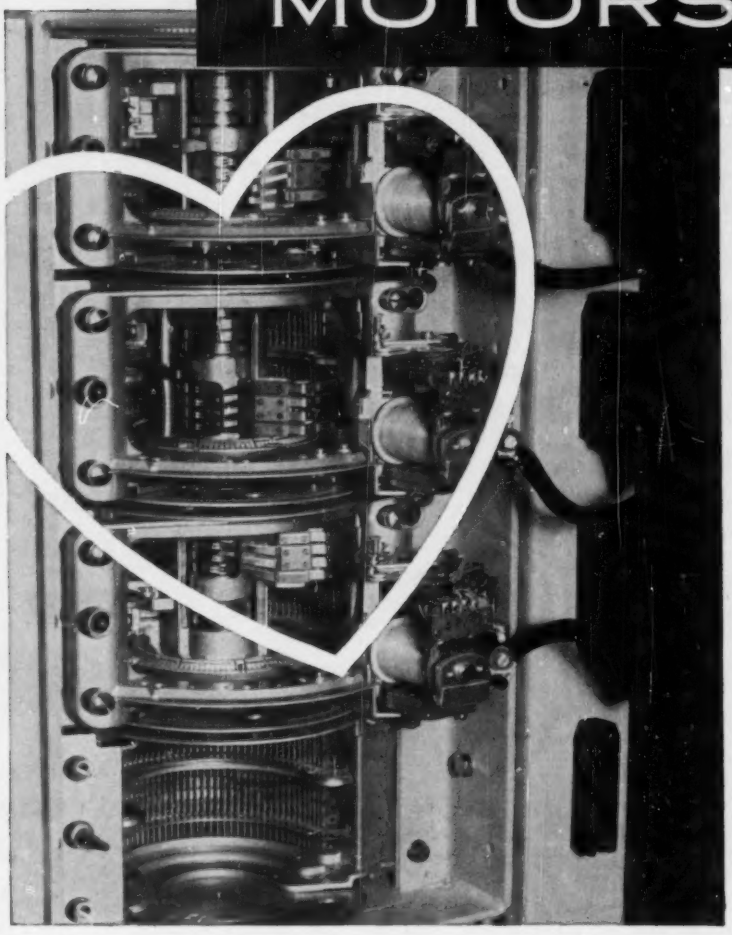

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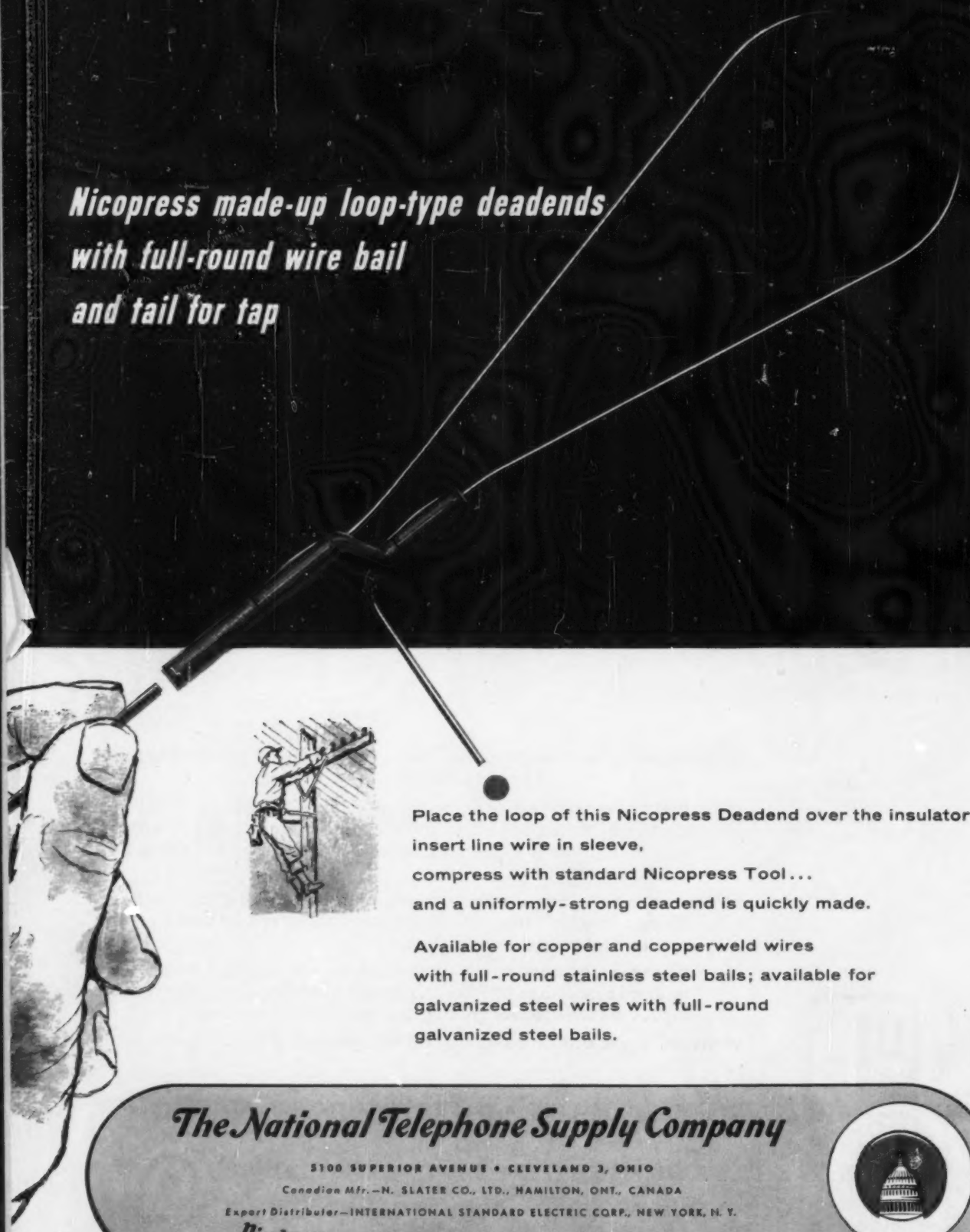

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